THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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JANUARY 14, 1985
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Follows 60

Accounting firm gives 5,000 Macs thumbs-up

Staff demand outstripping supply

By Kathleen Sullivan
CW West Coast Bureau

PORTLAND, Ore. — When Peat Marwick Mitchell & Co. accountants leave their downtown offices here on their way to an audit appointment, it is likely that some will be gripping the maroon straps of bulky gray carrying cases. Inside is the newest tool of their trade: an Apple Computer, Inc. Macintosh computer.

This scene is being repeated in Peat Marwick offices across the country — from Providence, R.I., where 10 Macintoshes reside, to Atlanta, where more than five dozen systems have been bought, to Los Angeles, where more than 150 Macintoshes are in use.

The accounting firm has purchased close to 5,000 of Apple's newest microcomputer to use in its audit departments. Most of the machines are being used in its 97 offices in the U.S., while about 1,000 systems have been shipped to overseas locations.

In interviews with Peat Marwick staff members in eight offices — Atlanta, Boston, Chicago, Los Angeles, New York, Provi-

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Banks insuring DP

Spread of electronic systems renders fraud, malfunction coverage 'critical'

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The nation's banks are increasingly turning to insurance policies to protect themselves from losses caused by malfunctioning computer systems and computer crime, according to a survey by the American Bankers Association.

"Obtaining adequate yet cost-effective insurance is a critical management problem bankers continue to face, particularly as new banking technology, including the rapidly expanding use of electronic processing and networks, has made banks more vulnerable to fraud and abuse," an association statement said upon release of the survey recently.

The association's "1984 Bank Insurance Survey," based on a sample of 622 banks and covering calendar year 1983, reported the following:

■ The number of banks with separate insurance policies to cover data processing increased to 43% in 1983. For large banks (with assets of $1 billion or more), the percentage was more than

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TOP OF THE NEWS

A major government study on VDT safety is turning into a controversy before it begins, as government and labor argue over the study's scope. **Page 2.**

■

Computerized health care cost management systems are enabling businesses to curb the rate of increases in employee medical costs. **Page 26.**

■

A programmer is free on bail after surrendering himself to Houston police, who allege he illegally accessed a credit bureau's computerized files and used the pilfered information to obtain 76 credit cards and steal $100,000. **Page 7.**

■

Apollo Computer, Inc. has chopped up to 38% off the price of its 32-bit workstations and also introduced an enhanced version of its server processor. **Page 67.**

■

The U.S. Department of Commerce relaxed export rules governing the sale of certain low-end computers to foreign nations, but some manufacturers think the department's regulations are still not liberal enough. **Page 89.**

■

Something new inside

SOFTWARE BENCHMARK

On page 11, *Computerworld* begins a monthly feature on micro software benchmarks, conducted by Yates Ventures, Inc.'s Software Evaluation Laboratory Service. The feature will report the results of benchmark tests conducted on software packages used in the corporate environment, with in-depth analyses supported by charts and tables drawn from test results. Today's benchmark pits Access Technology, Inc.'s 20/20 integrated package against Lotus Development Corp.'s 1-2-3.

FYI

If Bud Goode were a betting man, he'd take Miami

But the football forecaster's Sperry says it will be the 49ers by a point

By Bruce Hoard
Special to CW‡

LOS ANGELES — As always, there are the qualifications. Bud Goode never just comes out and predicts an unequivocal Super Bowl victor before the fact — computer or no computer.

"I'm going to hedge because of the home field advantage," declared the man who sells his weekly, 80-page computer analysis to six National Football League teams and CBS, Inc. analyst Dick Vermeil. "I have [the San Francisco 49ers] by one point — 1.85 points actually."

The 49ers have the home field advantage because this Sunday's Super Bowl XIX against the Miami Dolphins is being played at Stanford Stadium in Palo Alto, Calif. And

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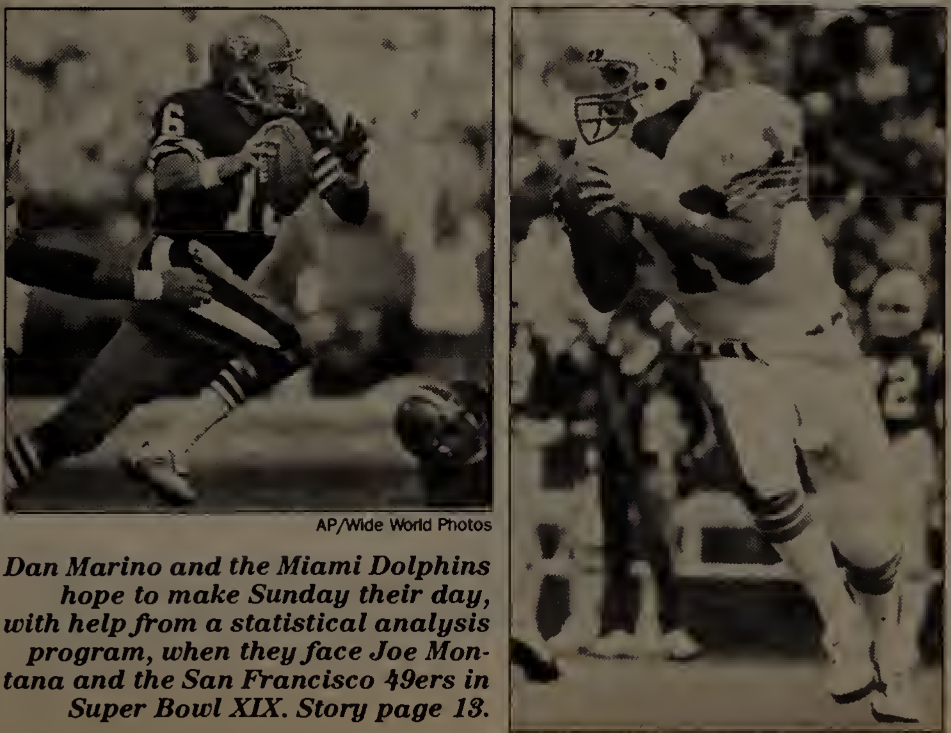

AP/Wide World Photos

Dan Marino and the Miami Dolphins hope to make Sunday their day, with help from a statistical analysis program, when they face Joe Montana and the San Francisco 49ers in Super Bowl XIX. Story page 13.

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‡ *Hoard is editor of* On Communications.

NEWSPAPER

Focus of Niosh VDT study under fire

Labor groups call proposed pregnancy-related study too narrow

By Mitch Betts
CW Washington Bureau

A major study by the National Institute for Occupational Safety and Health (Niosh) on how intensive use of VDTs affects pregnant women is turning out to be controversial even before it begins.

Niosh is now planning the scope and methodology of the two-year study amid charges from labor organizations that under the agency's draft plan, the study would virtually ignore the issues of radiation and stress. These concerns were raised at a Niosh-sponsored public hearing in Cincinnati last month and in subsequent interviews.

The dispute, all parties agreed, focuses on whether the study, expected to begin late this spring, should be limited to discovering if VDT users statistically have more reproductive problems than nonusers, or whether the study should also test for radiation, stress and problems with ergonomics in the event it shows VDTs are linked to reproductive problems.

Niosh plans to conduct a limited study that compares the pregnancies of women who are full-time VDT users with the pregnancies of women who have the same job but do not use VDTs, according to Niosh officials and others familiar with the plan.

The retroactive study, with a total sample population of about 4,000 married women of reproductive age (2,000 VDT users and 2,000 nonusers), will focus on those women in the population who were pregnant in the last two years. Niosh may also conduct a prospective study, officials said.

> *The thrust of the study is to determine whether VDT users have more abnormal reproductive outcomes than nonusers.*
> — Dr. Teresa Schnorr, Niosh epidemiologist

Dr. Teresa Schnorr, the Niosh epidemiologist who will conduct the study, said the study will determine whether VDTs have any effect on pregnancies. "We will measure whether [VDT] users have an excess of abnormal reproductive outcomes compared to [those of] nonusers," she said.

Niosh officials said they will consider the comments made by members of the scientific "peer review" panel as well as labor and corporate officials when making revisions to the study's methodology. However, Schnorr observed, "I don't think there will be any major changes in the protocol."

Study should be 'more expansive'

"I think [the Niosh study] should be much more expansive than it is," said David E. LeGrande, a representative of the Communications Workers of America in Washington, D.C. As now planned, the study will not measure low-level radio-frequency radiation emitted by the VDTs or specifically evaluate the stress of VDT work, he said.

Likewise, Diana Roose, research director of the National Organization of Working Women, 9 to 5, in Cincinnati said: "We think it should be expanded in scope, and it should test all of the potential risk factors at the same time that it's looking at whether there's an increased risk in the first place. The reason is that it will only be a partial answer to the question if they do a very limited risk study."

Schnorr acknowledged that Niosh will not measure radiation from the VDTs and that stress is not a major variable in the study because both the VDT users and nonusers have high-stress jobs. She emphasized that the thrust of the study is to determine whether VDT users have more abnormal reproductive outcomes than nonusers.

If "excess" reproductive problems are not found, then no further research will be undertaken, she said. If such problems are found, then Niosh could investigate the specific causes, she said.

Dr. Robert Arndt of the University of Wisconsin, a member of the Niosh peer review panel, said that his first inclination was to support a comprehensive study that addressed stress and ergonomic factors, but he has begun to reconsider that view. "Is it possible to actually study this many variables in one study of this size, or are we really going to have so many questions that we reduce the power of the study?" he asked. Arndt emphasized that the study must be powerful enough to satisfy unions and other critics. It must "have enough power to detect an effect if it's there," he said. "If you can't satisfy these people on that issue, then you might as well not do the study, because the outcome is going to be worthless."

Dr. James Dunn, associate medical director for AT&T in New York, who has followed the debate, commented, "Keep in mind that 'limited' is not necessarily bad and 'big' is not necessarily good. A limited study may be very good in that it asks a very sharp question and you get an answer [that can be the basis for further research] . . . . A very big study can be very complicated and end up without much of anything."

Roose acknowledged that expanding the study would make the research more complicated but maintained it is feasible.

Unless the potential risk factors are investigated in the same study, Roose said, VDT operators may have to wait for another study for a definitive answer to their questions about VDT health risks.

A budget for the study has not yet been established, according to Schnorr. Niosh, a unit of the U.S. Department of Health and Human Services' Center for Disease Control, will distribute copies of the final report to the participating employers and employees and to the general public, she said.

Cuirle to pen column 'Management Matrix'

Walter F. Cuirle joins *Computerworld* this week as a regular columnist.

His column, "Management Matrix," will examine those items and areas that impact the information processing budget in large corporations.

Topics will run the gamut from how to get the best value for your dollar from a DP consultant to advice on handling key employee resignations so they have the least possible impact on your department's productivity.

Cuirle is currently a consultant associated with Nicholas DeMaio Associates in Bryn Mawr, Pa. The firm provides survey, installation, training and conversion support services for large corporations.

As an independent consultant, Cuirle specializes in designing and producing technical documents and training curricula for major technological firms.

Prior to working in the computer industry, Cuirle was a lecturer in physics for the Rochester Institute of Technology.

He received a B.S. degree in physics from St. Joseph's University in Philadelphia.

You tell us

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Is your company involved in an unusual application of DP technology? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes? Heard any hot news about vendors? Are you aware of technology or trends the trade press is overlooking?

If so, we'd like to hear from you. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor.

We can't be everywhere — but our readers are.

CORRECTIONS

The purchase price for Lattice, Inc.'s C-Sprite debugging tool was incorrectly stated [CW, Dec. 17]. The correct price is $175.

A major new financial function of Version 2.1 of Digital Equipment Corp.'s VAX Decalc [CW, Dec. 3] is internal rate of return, not Interrupt Return Register, as was previously reported.

NEWS SUMMARY

Business travelers may want personal computers in their hotel rooms, but the hotels are saying the demand is not great enough/**4**

A programmer has been charged with the theft of $100,000 in what reportedly was a crime involving the illegal access of a credit bureau's computer/**7**

The Federal Communications Commission has delayed the implementation of special access tariffs that were due to be placed on private-line rates/**8**

The General Accounting Office has been accused of wasting almost $13 million on a botched computer project/**9**

At Di-Core, Inc., discarded computer systems and materials are turned into valuable assets/**10**

Software Benchmark: Access Technology, Inc.'s 20/20 vs. Lotus Development Corp.'s 1-2-3/**11**

The Miami Dolphins will devise a game plan for their Super Bowl battle against the San Francisco 49ers with the help of a computer/**13**

Product Spotlight: Microcomputer data base management systems/**14-16**

MIS costs for retailers increased 18% in 1983, while sales grew only 16%, according to a recent survey/**17**

Increased quantity and improved quality are just two of the benefits to be found in telecommuting/**18**

Hewlett-Packard Co. has launched a transportable, AT&T Unix-based micro for technical professionals/**22**

Computerized health care cost management systems are allowing businesses to slow the growth rate of employee medical expenses/**26**

A New Zealand forestry firm is the country's first user of a U.S. vendor's general ledger system/**32**

A local-area network has taken much of the labor out of the labor-intensive task of writing modern weapons systems technical manuals/**36**

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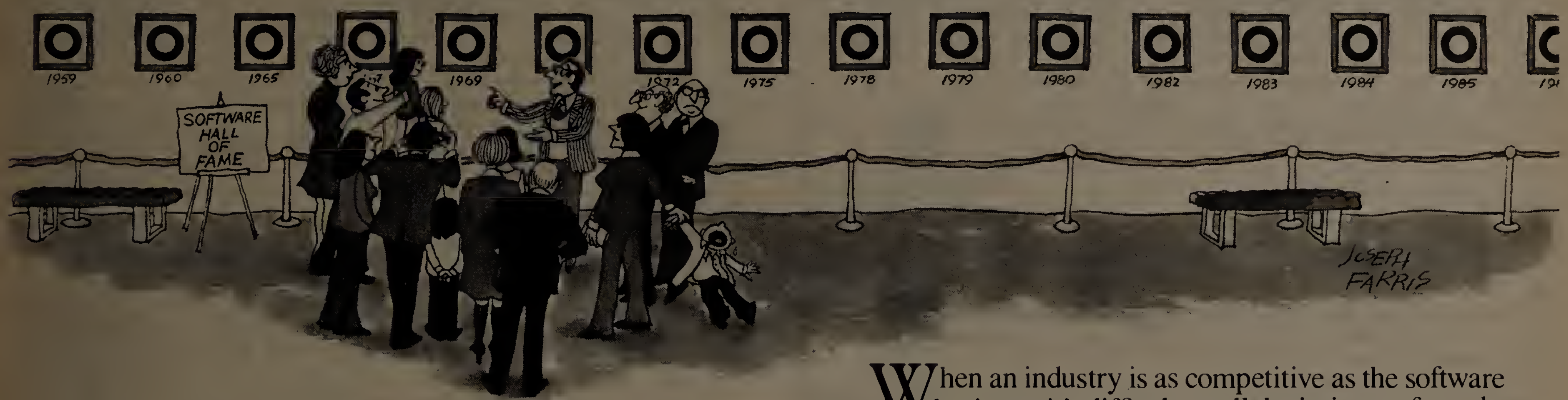

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There's no room at the inn for personal computers

Major hotels have reservations about supplying business travelers with micros

By Charles Babcock
CW New York Bureau

NEW YORK — You reach your hotel after a hard negotiating session with a customer and decide to review the data on his previous contracts. You pull out the floppy disk you have been carrying in your briefcase since you left the office and pop it into the hotel-provided microcomputer. The information instantly appears on the screen.

For most people in business, this scene is likely to remain hypothetical for some time. Businesses may be buying personal computers like paper clips, but few hotels are ready to offer computers to business travelers either in their rooms or on the premises.

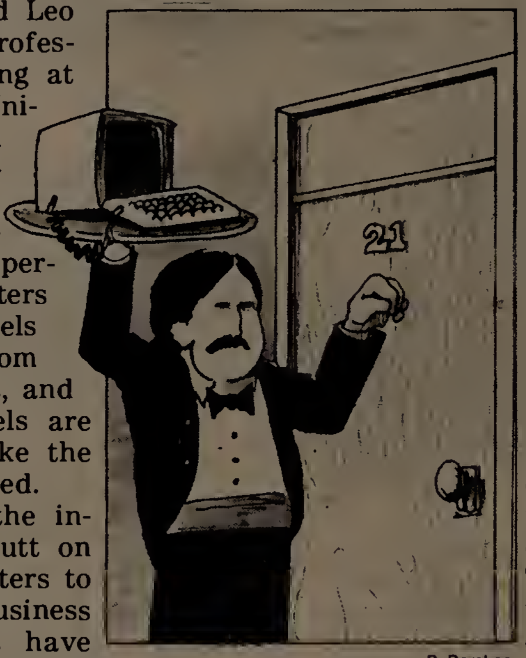
In New York, the Plaza, the Ritz-Carlton, Marriott's Essex House and other midtown Manhattan hotels catering to business travelers do not offer or plan to offer computers to their business guests. "Tell me, what do they use them for, these personal computers?" the concierge at New York's prestigious Pierre Hotel asked.

Even Hilton Hotels Corp., the chain that bills itself as "America's business address," said it sees little need for the service. It offered guests an IBM Personal Computer at its Miami hotel, "but I don't think it's gotten much use," said John R. Bennett, vice-president of information systems for the chain, which is headquartered in Beverly Hills, Calif.

Although hotels "desperately want to differentiate themselves from the competition, especially for the frequent business traveler," few are turning to computers as a way of doing so, noted Leo M. Renaghan, professor of marketing at the Cornell University Hotel School in Ithaca, N.Y.

Early attempts to make personal computers available in hotels have failed from lack of interest, and now most hotels are reluctant to take the step, he explained.

He related the industry scuttlebutt on offering computers to guests. "Most business travelers don't have the free time to work on a computer. Anyway, there's still a lot of computer illiteracy out there," said Paul K. Manley, assistant director of information services at the Hilton International in New York, which is not a member of the U.S. Hilton chain.



P. Barokas

One of the examples most frequently cited is that of the 18-hotel, Scandinavian chain, SAS Hotels of Oslo. It has made IBM Personal Computers available in its facilities in Oslo and Copenhagen and in Gothenburg, Sweden, but so far, demand "has been very spotty," according to Christian Sinding, vice-president for hotel marketing at SAS.

But representatives from two U.S. metropolitan hotels said they think the demand is growing and is just waiting to be tapped. The Hyatt Regency Chicago, the 2,033-room hotel that is the largest of the Hyatt chain, offers eight IBM Personal Computers in its business center on the 32nd floor of its East Tower.

The computers are in use constantly, especially from midmorning to noon and from 5 p.m. to 8 p.m., said Howard J. Weiner, president of Easy Keys, Inc., the private contractor running the center for Hyatt. Business travelers like to review contract information or prepare quotes on the machines, he said.

A hotel considering a similar service is the Vista International in the World Trade Center in New York.

"I think the time has come, and I would like to see the service implemented by the end of the year," said James H. Araki, director of information systems for Vista. The hotel serves as host to travelers visiting nearby Wall Street. Araki said he thinks they will provide a ready clientele for computer services.

'Willing to consider anything'

However, these are the exceptions, according to Cornell's Renaghan.

"Hotels are willing to consider anything" that might attract business travelers, who are among a hotel's highest paying guests, he said. But the figures on computer use, either in rooms or in business centers on hotel premises, are low.

"The Hyatt people will be very polite and tell you there is interest, but the figures aren't there. What's the payback to the hotel?" Renaghan asked.

Many users aren't travelers

Hyatt officials acknowledged that many of the users of the business center in their Chicago hotel "are visitors from the high rises and office complexes in the neighborhood," not hotel business travelers, said Nancy A. Ruth, public relations director for the hotel.

Nevertheless, the center's computers satisfy the requests that trickle in to the concierge staff, and the micros help keep Hyatt "one step ahead of the competition," she said.

Hyatt representatives said the company is watching the experiment that began in October to see whether the chain should make computers available at other major downtown venues. So far, it has invested little in the venture. Easy Keys provides the eight computers and three printers, capable of dot-matrix, letter-quality or graphics printing. It also offers popular software packages, such as Lotus Development Corp.'s 1-2-3, and provides the center with a staff. The Hyatt made a suite available for the center at no charge to users.

Easy Keys collects the $8 per hour fee for the use of the equipment; many customers simply drop off word processing or quote preparation work to be done by Easy Keys employees, according to Weiner.

Demand by travelers growing

Some hotel observers think the demand for computers by travelers is growing quickly. In 1984, 2.1 million IBM Personal Computers were sold, according to Dean Witter Reynolds, Inc., a New York-based investment research firm.

As microcomputers spread through executive ranks, Dean Witter predicted that more travelers will become dependent on the quick calculations and access to information that they provide.

According to SAS' Sinding, "Perhaps we should have a computer weekend [with guests staying at the hotel at special rates to learn about computers]. I would like to see if we could do something more exciting with computers."

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Firm says Macintosh's limitations pose no problems

Have any of the Apple Computer, Inc. Macintosh's reputed shortcomings — limited memory and lack of a high-speed, letter-quality printer and local-area network — hindered acceptance among Peat Marwick Mitchell & Co.'s staff? Most agreed that these issues have not presented problems for Peat Marwick users.

Because Peat Marwick's accounting software was written for Apple's original 128K-byte Macintosh, its memory capacity was not cited as a shortcoming in most of the offices. "In 90% of our work, the 128K-byte machine is adequate," one Peat Marwick partner said.

But according to Richard True-blood, senior manager in Peat Marwick's Boston offices, the limited memory "has been a little bit of a shock" to some accountants who are accustomed to working with Lotus Development Corp.'s 1-2-3 spreadsheet models on computers with larger memory capacities.

Although Microsoft Corp.'s Multiplan "skirts around that limitation," accountants have been forced to plan a little more when working with the Macintosh, he said.

While Peat Marwick's executive offices are recommending against the immediate purchase of the 512K-byte upgrade for the Macintosh, many staff members said they were considering upgrades for a portion of their machines. "As we get into more and more sophisticated applications, 128K bytes is inadequate," explained Arvin Mark, audit partner in Peat Marwick's Chicago offices.

The Macintosh's speed was an issue for some accountants, especially with the growing expertise of Peat Marwick users. "The more you use it, the slower it seems," one senior audit manager said.

Most of the Peat Marwick staff said their work did not require a letter-quality printer because the accountants prepare draft financial statements that are submitted to the firm's word processing department for final reports. "We could use a faster printer," one Peat Marwick partner said. "But since our software spools to the printer, our accountants can keep working while printing is going on, so it hasn't been a problem."

And because most of the systems are being used in stand-alone applications in the field, Peat Marwick staff members have not been clamoring for a local-area network, they said.

AUDIT from page 1

dence, San Jose, Calif., and here — *Computerworld* found that, in general, the Macintosh has received an enthusiastic reception.

William Hockensmith, senior manager in Peat Marwick's office here, said that everyone from new employees to senior partners with 20 years experience has been trained to use the Macintosh. Although he noted that there is always some resistance to computer use, the Macintosh's design has helped new users overcome their fear and reluctance. "Our staff learned the system and began using the [Macintoshes] more rapidly than I thought they would," he said.

Arvin Mark, audit partner in the Chicago offices of Peat Marwick, said that some staff members are using the Macintoshes more than others. "Some are still in the process of becoming comfortable with the computer, and some were a little gun-shy at first," he said. "But no one has said. 'I don't want to use it; take it away.' "

In most Peat Marwick offices, each partner and manager has been given a Macintosh. And in general, each in-charge accountant — the person who heads up an audit in the field — has also been assigned one. The accounting firm's corporate goal is to have at least one Macintosh on-site during an audit.

Several offices said demand for Macintoshes was already outstripping supply. Richard Trueblood, senior manager in Peat Marwick's Boston offices, said its 135 Macintoshes are in high demand. "At this point, everyone in the audit department would like to have one," he said.

'The Macintosh frees the accountant to spend more time assisting the clients.'

— William Hockensmith, senior manager in Peat Marwick Mitchell & Co.'s Portland, Ore., office.

At present, the typical configuration for a Peat Marwick in-charge accountant includes a 128K-byte Macintosh, an external disk drive, a 1,200 bit/sec modem and a numeric keypad, which fits into a specially designed Macsack that sports a corporate logo. A wide-carriage printer fits into another Macsack.

With each system, Peat Marwick staff receives a variety of software, including Apple's Macwrite, Macpaint and Macterminal and Microsoft Corp.'s Multiplan spreadsheet program and Chart business graphics software. In addition, the accountants use two programs that Peat Marwick's programming staff developed: a financial statement assembly package and a consolidated financial statement program designed for larger firms with subsidiaries.

According to Trueblood, the system has been well received among the accountants, who recognize the importance of automating some of the repetitive and time-consuming tasks of accounting.

Using Peat Marwick's software, for instance, accountants enter the details of a general ledger account into the system. If any adjustments are made, the computer updates the schedules and financial statements to reflect the change. In the past, those additions or adjustments were made by hand with accountants plowing through a stack of papers and entering changes with a pencil.

"The Macintosh frees the accountant to do what he does best — make judgment calls, evaluate test results and spend more time assisting the clients in improving their businesses," Hockensmith said.

"Our people are well educated and have a great deal of expertise," Trueblood added. "This gives us a way to permit them to apply that knowledge and expertise and focus [on] more qualitative areas."

Peat Marwick has also found a positive response among its clients, who are intrigued and curious when the accountants arrive and unpack their Macintoshes, Mark said. Its clients are encouraged to see computers being applied to audit work, he said. "It brings Peat Marwick into the 20th century," he added.

But the real test of the Macintosh is still to come, noted one audit partner, with the approach of the accountants' busy season, which traditionally falls between January and March. By this spring, the accounting firm will undertake an extensive evaluation of the systems.

BANKS from page 1

91%. The DP policies typically cover equipment, media, extra expenses and, in some cases, business interruption.

■ More than half of the large banks obtained a rider on their standard "blanket bond" banking insurance to cover unattended automatic teller machines (ATM). In addition, more than 79% of these large banks had a computer systems rider to cover electronic funds transfers, ATM systems and, in some cases, the bank's proprietary computer systems, software programmers and independent consultants.

■ An average of 7% of all banks elected to have computer crime coverage as a separate policy, an option first offered in 1982.

■ Overall, the banking industry in 1983 paid premiums totaling $11.6 million for DP insurance policies and $4.7 million for separate computer crime policies.

The survey costs $24 ($16 for association members). It has an ordering request catalog number of 215500 and is available from the American Bankers Association, Order Processing, 44-B Industrial Park Drive, Waldorf, Md. 20601.

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Theft of $100,000 traced to credit bureau system tap

By John Gallant
CW Staff

HOUSTON — A 24-year-old programmer is free on a $30,000 bond after being charged with the theft of $100,000 in what authorities here said was high-tech fraud involving the illegal tapping of a local credit bureau's computer system.

Late last month, according to Assistant District Attorney Judy Mingledorff, Robert J. Hoxie of Houston surrendered to the Harris County Sheriff's Department after he learned that the agency had issued an arrest warrant charging him with theft.

Mingledorff said authorities believe Hoxie gained illegal access to the data bases of the Greater Houston Credit Bureau and obtained the credit histories of 38 affluent local residents.

Applied for 76 credit cards

He then allegedly used the residents' names and credit information to apply for 76 Mastercard and Visa cards from the First City Bank in Dallas. He supposedly later used the cards to issue himself at least $100,000 in cash from a number of automatic teller machines (ATM).

At his arraignment, Mingledorff said, Hoxie pleaded innocent to the theft charge. His bond was originally set at $100,000 but was later reduced to $30,000. If convicted of theft, a second-degree felony under Texas law, Hoxie could be sentenced to up to 20 years in prison or fined as much as $10,000. No trial date has yet been scheduled.

Mingledorff said investigators have not yet discovered the computer equipment Hoxie allegedly used to access the bureau's systems, and they do not know how the self-employed programmer tapped into the credit histories. Mingledorff said Hoxie allegedly obtained credit information on several bank presidents, board chairmen of local banks, prominent attorneys and oil company officers, among others. Included in the credit data Hoxie allegedly obtained was information on birth dates, names of relatives, current and previous employers, creditors, credit card balances and savings and checking account numbers.

According to Mingledorff, Hoxie had the credit cards he applied for mailed to a variety of post office boxes and other drop-mail addresses that differed from the home addresses of the residents. Wearing a wig and sunglasses so he would not be recognized in photographs taken at the ATMs, he allegedly used the cards to withdraw cash over a period spanning from mid-July to late October.

Mingledorff said Hoxie's scheme came to light when a delinquent credit card account was brought to the attention of a First City Bank officer in Dallas. The officer recognized the cardholder as an officer of a First City Bank branch in Houston. After speaking with the Houston branch officer and discovering that he had not applied for the credit card, the Dallas banker ordered an investigation into all card accounts that had different home and mailing addresses. Authorities discovered 76 applications made out in the same handwriting.

At approximately the same time, according to Mingledorff, Hoxie allegedly rented a truck using one of the bogus cards, and the rental clerk recorded his license and automobile registration numbers and photographed him. Because the credit card Hoxie allegedly used was under investigation, authorities used the rental company's information to trace his identity.

Mingledorff said both police and bank officials are continuing their investigation into the case to prevent similar trespasses into the credit bureau's systems.

National Semi plans two-week production halt

SANTA CLARA, Calif. — Plagued by weak demand for its semiconductors, National Semiconductor Corp. last week announced it will shut down production for two weeks beginning Feb. 11 and postpone merit pay raises for six months.

Company officials said National Semi might also stop production for an additional two weeks in April if the demand for its chips does not improve substantially.

The February shutdown will affect over half of the 9,500 employees at all levels at National Semi's operations here, according to National Semi spokeswoman Linda Baker.

National Semi has not yet decided how many of its 39,000 worldwide employees will be idled, Baker said, but those that continue working during the shutdown will be employees involved in developing new products and in providing customer sales and support.

The shutdown marks the first time since the 1981 recession that National Semi has ceased production aside from holiday closings, according to Baker.

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RECOVERY

FCC delays access charges again

IDCMA points out discrepancies in local telephone companies' rates; deadline extended to Feb. 15

WASHINGTON, D.C. — The Federal Communications Commission has extended the Jan. 19 implementation deadline for special access charges that exchange carriers can levy on long-haul carriers. The deadline for the new charges, which are expected to increase private line rates, is Feb. 15.

The FCC has twice postponed the special access charges [CW, Dec. 10] after ruling that the local telephone companies that filed the rates were charging different rates for equivalent services in different parts of the country.

Last week the Independent Data Communications Manufacturers Association (IDCMA), an equipment association, submitted comments on the local telephone companies' revised special access rates, pointing out that proposed termination charges for 1.54M byte/sec data communications links were $77.09 for Oregon and $505.86 for Illinois.

> *IDCMA said an independent study found a 10:1 variation in the carrier-quoted termination costs for 1.54M byte/sec service across the country.*

IDCMA also pointed out that current proposed special access channel rates based on distances would make users more inclined to use cheaper, lower capacity links, such as 56K byte/sec, rather than multiplexing, or dividing 1.54M byte/sec links, since rates would vary in different parts of the country.

"Although the carriers have noted that geographic differences affect costs, that does not explain the fact that the total charge for 15 channel miles of 1.54M byte/sec service is $843.33 in Michigan, compared [with] an astounding $1,812.96 in the neighboring and geographically similar state of Illinois," the IDCMA said.

IDCMA said an independent study by an economic consulting firm found a 10: 1 variation in the carrier-quoted termination costs for 1.54M byte/sec service across the country. The association urged the FCC to suspend the proposed tariff submissions and investigate the cost basis filed by the telephone companies.

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Corporate Software buys MSA division

By Paul Gillin
CW Staff

SANTA MONICA, Calif. — Management Science America, Inc. (MSA) has sold the first piece of its ailing microcomputer software business.

Earlier this month, Corporate Software, Inc. bought MSA's Microcomputer Distribution Division (MDD) for an undisclosed amount of money. The transaction effectively doubles the size of Corporate Software, which was MSA MDD's largest competitor among vendors who sell micro software exclusively to corporations. Corporate Software Chairman Morton Rosenthal said the revenues of the combined companies are now about $1 million per month.

MSA would not comment on the transaction. Last October, MSA announced that it would sell all four divisions of its packaged microcomputer software operation [CW, Oct. 22]. The three unsold divisions are Educational Operations, Domestic Operations and International Operations.

The deal affects MSA MDD headquarters here. Rosenthal said six MDD sales representatives will be added to the Corporate Software national sales force. He added that the technical support staff from MSA will be offered a transfer to Corporate Software headquarters in Waltham, Mass.

According to Rosenthal, MSA will close down its operations group here and lay off a small number of people. MSA would not comment on Rosenthal's statement.

Rosenthal said MSA MDD customers should see some service improvements as a result of the transaction. "This business is different from MSA's business of selling mainframe software," he explained. "We have more senior management and operations set up, and we expect improvements in service because we have better technical capabilities."

The two firms offered many of the same services, Rosenthal said. Both provided discount sales and software support, special orders, consulting and evaluation copies on loan. He said Corporate Software offered somewhat larger discounts.

BOWL from page 1

Palo Alto is just down the road from the friendly confines of Candlestick Park, where the 49ers normally play their games.

Goode, the former press agent to Groucho Marx and still a gung ho body surfer at 61, is not a betting man, nor does he, in his own words, "incite to bet." This despite the fact that he uses a Sperry Corp. 1106 computer and his 130-variable regression analysis to pick NFL winners against the line for the *New York Post* each week during the season.

Objectively speaking, the 49ers should prevail if they play up to statistical snuff. During the course of the season, their defense allowed a stingy 2% of their opponent's passes to go for touchdowns, while 8% of Dolphin quarterback Dan Marino's passes ended up hitting pay dirt. In Goode's scenario, the immoveable object wins against the irresistable force.

Such is not apparently the case when pitting the 49ers' running attack against the Miami "Killer B" defense, Goode said. The 49ers churned out 4.62 yards per rush, while the Dolphins gave up a league-last 4.7 yards per rush. "However," he added, "when put to the test during the season, the Dolphins have been able to stop a strong running attack."

Looking at the passing game from another perspective, San Francisco quarterback Joe Montana averaged 7.46 yards per pass attempt, while his Miami counterpart Marino led the league at 8.57. "This is a standout offensive passing [statistic]," Goode said of Marino's numbers.

But so much for objectivity. If Goode was a betting man, he'd lay his money on the Dolphins and Marino's golden arm. "Getting down to the bottom line, I'll take the two points and Marino," he stated. You've got to give this much to Goode — one way or the other he's going to be right.

Betting on the Dolphins — or more pointedly, betting against Goode — might make sense, considering the fact that he is zero for four with his computer-based Super Bowl predictions since 1981. But fear not. According to Goode, only one Super Bowl out of every three should be won by the team that stacks up the strongest statistically anyway.

If you're starting to get a little queasy about betting on Goode's numbers, consider this: He had 27 wins and 21 losses against the line on his best bets for the *New York Post.* Of course, he bases his best bets on games featuring the strongest vs. the weakest teams. But that shouldn't matter if you're only betting against the point spread anyway, right?

Goode succinctly summed up the whole idea of wagering in such instances, saying "I don't think you can win gambling on football games."

Panel says GAO botches system, wasting $13 million

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. General Accounting Office (GAO), the congressional watchdog agency that usually castigates other federal agencies for bad management, is now under fire. A U.S. Senate panel has charged GAO with wasting almost $13 million on a botched computer system.

The Senate Committee on Governmental Affairs, in a recent staff report that reads like a GAO audit, said the failure of the GAO's Consolidated Administrative Management Information System (Camis) was caused by "long-standing deficiencies in GAO's procurement activities.

"It is particularly disturbing that any serious problems in GAO's general procurement practices would be allowed to remain uncorrected since GAO is in the business of auditing and evaluating the procurement activities of government departments and agencies around the world and of providing expert advice to the Congress on procurement policies," the report said.

Charles A. Bowsher, comptroller general and chief of GAO, denied that the failure of the Camis project was GAO's fault. Instead, he blamed the failure on the computer contractor, Boeing Computer Services of Vienna, Va. Sen. William V. Roth Jr. (R-Del.), chairman of the Senate committee, said, "Many of the mistakes made in this procurement occurred early in its history before the arrival of the current comptroller general, Charles Bowsher. While Bowsher did take action to improve the situation, the fact remains that the contractor was paid more than $10 million, and GAO has little to show for it."

In June 1981, GAO awarded Boeing a contract to establish an administrative support system that would consolidate the agency's 18 different personnel, financial and assignment management systems. But internal audits showed that Boeing's cost estimates were too low, and escalating costs and delays became a serious problem, according to the committee report.

Ultimately, the problems forced GAO to permit the Boeing contract to expire in October 1984, at a total cost of $12.8 million. "At that point in time (more than three years into the work), GAO was obligated to pay Boeing approximately $10.6 million (about two-thirds of the amount GAO expected the total Camis procurement would cost), and received a disproportionately smaller portion (perhaps only one-fifth or less) of the work called for in the contract," the report concluded.

One internal audit was titled: "GAO's Procurement of Contract Services — Need to Practice What We Preach."

GAO's Bowsher, in his response to Sen. Roth, said, "We agree that GAO should have done a better job during early stages in the Camis project. But I am concerned that your report does not more fully recognize the extent to which the early deficiencies were recognized and remedied.

"We do not believe the project failed because of the problems identified in your report," Bowsher said. "Instead, we believe it failed because [Boeing] did not properly manage technical issues critical to the success of the project."

Bowsher said Boeing in 1984 repeatedly failed to meet its deadlines and expected substantial cost overruns. "The project was terminated because [Boeing] failed to meet its milestones and could not give us reasonable assurances that they could overcome their technical management problems and deliver the system within agreed-upon time frames and cost," he concluded. A Boeing spokesman said the firm has no comment on the matter at this time.

Draw the line on graphics use

What do users want from graphics systems and software, and how can DP managers best meet their needs? Find some answers in *Computerworld's* March Special Report on graphics systems.

The Special Report will focus on mainframe, minicomputer and microcomputer graphics and the fine lines among the three. Contributions to the Special Report should take one of two forms: tutorial articles discussing issues or trends or applications stories outlining a particular user firm's experience.

Articles may range from four to six typed, double-spaced pages. Artwork, such as charts, graphs and photographs, is also welcome.

Authors should include brief biographies and telephone numbers at which they can be reached.

The submission deadline for the March Special Report is Jan. 25.

If you have a story you would like to tell, or an issue on which you would like to speak, contact Janet Fiderio, Special Reports Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK
In re DAV-NA ASSOCIATES, Debtor. Reorganization No. 83-B-10776
(BRL) — NOTICE OF ENTRY OF AN ORDER REQUIRING CREDITORS TO FILE PROOFS OF CLAIM
TO ALL PERSONS ASSERTING A CLAIM AGAINST DAV-NA ASSOCIATES ARISING PRIOR TO MAY 25, 1983:

PLEASE TAKE NOTICE, that the United States Bankruptcy Court for the Sourthern District of New York has entered an order requiring all persons who assert a claim against Dav-Na Associates ('Dav-Na') arising prior to May 25, 1983, whether such claim is fixed, liquidated, unlinquidated, contingent or disputed, secured or unsecured, to file a proof of claim in accordance with the instructions set forth below with James P. Hassett, Trustee, on or before **January 31, 1985.**

Exceptions: Persons who assert claims solely as co-debtors, sureties or guarantors, must file a proof of claim as required herein on or before March 4, 1985. Persons who assert claims solely by reason of the recovery by Dav-Na's estate of money or property or the rejection by the estate of an executory contract or unexpired lease shall file a proof of claim in accordance with the Court's order within thirty (30) days of the recovery of the money or property by the estate or the rejection by the estate of the executory contract or unexpired lease.

ALL PERSONS WHO FAIL TO FILE A PROOF OF CLAIM IN ACCORDANCE WITH THE COURT'S ORDER SHALL BE FOREVER BARRED FROM ASSERTING A CLAIM AGAINST THE ESTATE.

Proofs of claim should be filed in conformity with Official Form No. 19 to the Bankruptcy Rules with: James P. Hassett, Trustee, in care of Zalkin, Rodin & Goodman, 750 Third Avenue, New York, New York 10017 (**not with the Clerk of the Court.**)

Further information may be had from the Trustee or his attorneys listed below.

Dated: New York, New York

November 30, 1984

BY ORDER OF THE COURT
BURTON R. LIFLAND
UNITED STATES BANKRUPTCY JUDGE

JAMES P. HASSETT, Trustee of Dav-Na Associates
35 Mason Street
Greenwich, CT 06830
(203) 869-7700
ZALKIN, RODIN & GOODMAN
Attorneys for the Trustee
750 Third Avenue
New York, NY 10017
(212) 682-6900

One firm's junked systems become another's treasure

By Maura McEnaney
CW Staff

BROOKLYN PARK, Minn. — Outdated computer systems may be of no value to a growing company, but the discarded units mean business revenue for Jack Umland, president of Di-Core, Inc.

In a 40,000 sq-ft warehouse here, Di-Core uses a chemical refining process to extract value from junked computer systems and industrial materials. These products often contain gold, silver and platinum, Umland said. Once extracted, the precious material is gathered together and sold to refiners.

Umland said that he came up with the idea of establishing a "de-manufacturing" facility while he was a manager of Control Data Corp.'s investment recovery division. It was there, he said, that he realized some firms often do not have the capital to create an in-house program to track and recover discarded materials.

With precious metal specialist Clive Leonard and two other partners, Umland launched Di-Core in October 1983. According to Umland, Di-Core pays other companies for their discarded material on a per-pound basis. Companies can also pay Di-Core a fee to recover precious materials from their discarded products. Di-Core assumes the leasing costs for the semitrailers that transport materials to the Brooklyn Park facility.

Hardware comes from a variety of firms, such as tool and die companies and manufacturers of circuit boards, telephones and electronic parts, Umland noted. "A lot of companies don't know what they've got. They don't know the value of what they're throwing away."

According to Umland, when the materials arrive in-house, they are divided into categories of base metal, resalable and reusable component parts and precious metals. All visible precious metals are recovered through dipping the material into chemical solutions. Encapsulated materials are refined, melted and turned into ingots.

> *'A lot of companies don't know what they've got. They don't know the value of what they're throwing away.'*
> — Jack Umland, Di-Core, Inc.

Since it began operation last May, Di-Core has collected more than one million pounds of surplus material, including systems from Burroughs Corp., Storage Technology Corp., CDC and Memorex Corp. Di-Core has grossed more than $750,000, and Umland expects this year it will gross between $1.5 million and $2.5 million.

Of all the computers salvaged, Umland said he sees "more IBM [machines] than anything." The IBM 370/168, 370/158 and 370/148 are among those that have come through the doors. "Those machines always [contain] precious metals, depending on the serial number of the product," he said. "The lower the serial number, the higher the gold content."

Aside from the precious metals market, Di-Core also dabbles in used parts, selling to third-party maintenance firms. "There is an enormous call for certain parts," ranging from printer heads to circuit boards, Umland said.

Like a detective who gathers clues by perusing a suspect's trash, Umland gets a capsulized view of current business climates by reviewing a company's excess materials. In what Umland termed our "wasteful society," computer systems are being replaced quite rapidly. "Companies are going to much more powerful machines quicker than they really need to in some cases," he observed.

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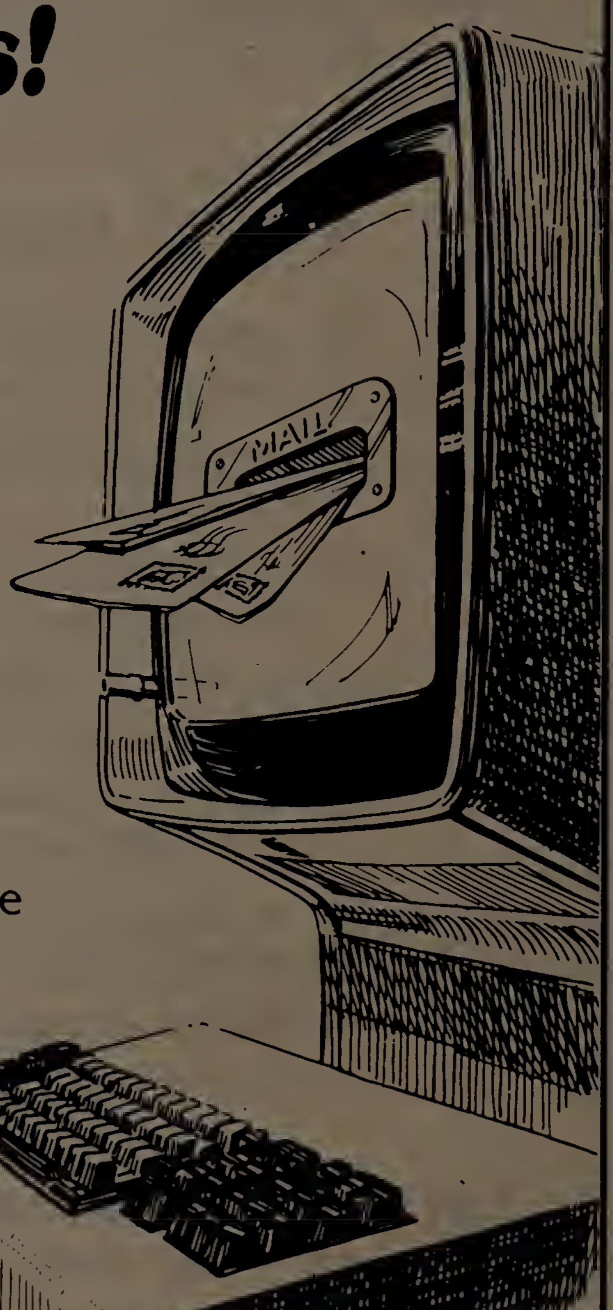

Access Technology, Inc.'s 20/20: Is it 1-2-3 for Unix?

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	LOTUS 1-2-3	ATI 20/20
PRICE	$495	$495
VIRTUAL MEMORY		
Minimum Required:	192 K	192 K
Maximum:	640 K	NONE
COMPATIBLES	YES	NO (1)
MONOCHROMATIC MONITOR	YES	YES
COLOR MONITOR	YES	YES
GRAPHIC/COLOR CARD REQUIRED	YES	YES
PRINTERS	Compatible with most printers on the market	IBM Okidata Epson Hewlett-Packard NEC

(1) Under development.

MODULE COMPARISON

LOTUS 1-2-3

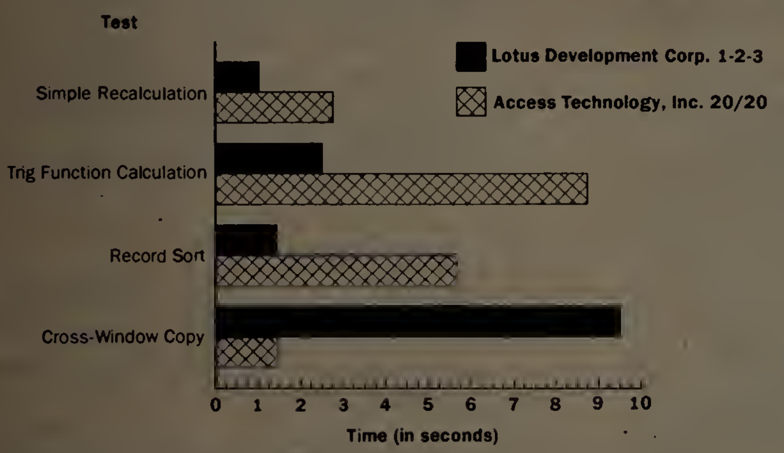
1. **SPREADSHEET**
   - Maximum Rows: 2,048
   - Maximum Columns: 256
   - Maximum Cells: 524,288
2. **BUSINESS GRAPHICS**
   - Color Available
   - Graph Types:
     - Line
     - Pie
     - Bar
     - XY Plot
     - Stacked Bar
3. **DATABASE MANAGEMENT**
   - Sorts:
     - Alphabetic
     - Numeric
     - Ascending Order
     - Descending Order
     - Row
   - Statictical Functions:
     - Sum
     - Average
     - Count
     - Maximum
     - Minimum
     - Variance
     - Standard Deviation

(1) Not currently available.

ACCESS TECHNOLOGY INC. 20/20

1. **SPREADSHEET**
   - Maximum Rows: 1,000
   - Maximum Columns: 1,000
   - Maximum Cells: 1,000,000
2. **BUSINESS GRAPHICS**
   - Color Availale
   - Graph Types:
     - Line
     - Bar
     - Comparison Bar
     - Stacked Bar
3. **DATABASE MANAGEMENT**
   - Sorts:
     - Alphabetic
     - Numeric
     - Ascending Order
     - Descending Order
     - Row
     - Column
   - Statistical Functions:
     - Sum
     - Average
     - Distribution
     - High
     - Low
4. **PROJECT SCHEDULING**
   - Data Arithmetic
   - Slack Calculations
   - Critical Path Calculation
   - GANTT (1)

COMPARATIVE BENCHMARK RESULTS
ATI 20/20 vs. Lotus 1-2-3



All results expressed as the average of 10 executions of the same test.
Both products were tested on the same computer.

MAIN MENU EXAMPLES

(simulated)

ATI 20/20

```
[Col: 0 Row: 0]
Copy Modify Edit Format Default Store Print Window Option Tools Graph Help Quit
Copy a rang of cells into a new range
/......0/......1/......2/......3/......4/......5/......6/......7/......B
```

LOTUS 1-2-3

```
AJ                                                                    MENU
Worksheet,  Range   Copy    Move   -File   Print   Graph   Data   Quit
Global,  Insert,  Delete,  Column-Width,  Erase,  Titles,  Window,  Status
      A        B        C        D        E        F        G        H
```

Access Technology, Inc. (ATI), Company Profile

Founded in 1980 by Allen Kluchman, the current president, ATI markets corporate decision support systems, including Supercomp-Twenty and 20/20. ATI has a direct sales force of seven employees who are marketing 20/20. They have also retained an outside sales group comprised of proven third-party consultants. ATI projects annual revenue for 1984 to be somewhere between $5 million and $7 million. For more information contact : Access Technology, Inc., South Natick, Mass. 01760

Since 1980, Access Technology, Inc. (ATI) has marketed a full-featured, second-generation spreadsheet package known as Supercomp-Twenty. A solid performer, it has an installed base estimated at 10,000 packages.

ATI now markets an integrated package for AT&T's Unix computers based on Supercomp-Twenty that will incorporate graphics capabilities and some data base management system (DBMS) tools.

The new product, 20/20, competes against Lotus Development Corp.'s 1-2-3 on MS-DOS machines — for which it is already available — and is the first such integrated product available for Unix. This prompted a review of 20/20 to see whether it really will be a 1-2-3 for Unix.

ATI's 20/20 should be technically strong enough to compete against 1-2-3 in the personal computer world and will probably become one of the premier business applications packages running under Unix.

A comparison revealed that 20/20 and Lotus 1-2-3 are alike in many respects. The main differences are in 20/20's advanced features: its worksheet consolidation and goal-seeking and time-scheduling capabilities. Also, 20/20 includes a sophisticated data import facility that outstrips 1-2-3's.

> *20/20 will probably become one of the premier business application packages running under UNIX*

The program's documentation is particularly strong, and the package should prove highly versatile. Its spreadsheet capabilities are quite solid, providing a good backbone for the program. Its graphics are integrated well, and graphs can be generated very quickly, although the present version does not provide pie chart capabilities. The program is especially strong in DBMS features.

User interface similar to 1-2-3

The 20/20's user interface is similar to Lotus 1-2-3's in many respects. For example, both packages present the user with similar command lines, which appear at the top of the screen. They each provide a help line directly under the command line.

Both packages can create and save command files or macros. Both sets of documentation include good definitions and examples of command files, but Lotus goes into much greater detail.

In general, 20/20 was quite easy to learn and use, especially with ATI's development of an on-line tutorial that closely resembles 1-2-3's.

The documentation also includes a 70-page section titled "Getting Started," that provides good support for the tutorial.

Written documentation a strong feature

One of the strongest elements of 20/20 is its written documentation, nicely typeset in two colors, including index tab separators. Its appearance is sharp, but its substance is better. It contains complete reference and glossary sections with a complete index. The command and function summaries are superb, including appendices that detail how 20/20 differs from Lotus 1-2-3 and Supercomp-Twenty. The hallmark of integrated packages is their versatility in combining diverse applications, and 20/20 is no exception.

For example, it allows the screen to be divided into four windows, displaying data from the spreadsheet, data base or graphics modules simultaneously. It will be able to interface with a wide variety of applications packages, from word processors to data bases to communications systems. Even more important, the package will be ported across a large number of machines, from micros to minis to mainframes.

ATI's 20/20 has a great advantage of being based on a proven spreadsheet product. It includes virtually all the basic spreadsheet features of Supercomp-Twenty and has several strong, advanced operations, such as depreciation calculation, investment analysis and goal seeking.

It also has solid document- and file-handling capabilities, including a new worksheet-linking feature not available on Supercomp-Twenty. Its column formatting is fairly strong, although it does not include the capability to center text or data in the cell. Its editing features are generally sound as well.

Graphics capabilities strong

The graphics capabilities provided in 20/20 are powerful because of its high-level integration with the spreadsheet module, yet the evaluation copy was limited without a pie chart facility. The program integrates spreadsheet data well enough so that any graph created from this information will be automatically redrawn whenever the data is modified.

Most impressive was the quality and timeliness of the graphs generated. We selected a comparison bar graph for a short test and were presented with a high-quality graph, including a legend, horizontal title and the vertical scale. Starting with the spreadsheet data itself, this graph was finished in well under five minutes.

Good approach to DBMS

ATI took a good approach to DBMS in general with 20/20, choosing to emphasize the data management features within the spreadsheet environment rather than saying a separate DBMS program had been incorporated into the package itself.

However, 20/20 can import data from a separate DBMS package through its Storage Import Data command.

In worksheet consolidation, 20/20 offers much greater flexibility than does 1-2-3, making the interrelation of large amounts of data easier. The program's goal-seeking facilities allow the user to select a desired value for a target cell, then assign the cell, whose value will be varied, until the goal is reached.

Lastly, one of 20/20's selling points is its time-scheduling feature. The Timechart option helps the user manage time-bound projects by calculating time lines for the parts of a project based upon data and dependencies specified by the user. These time lines can then be displayed on a Gantt chart.

Is 20/20 the 1-2-3 for the Unix world? Actually, it may be a little more. With its on-line tutorial and help, 20/20, except for not yet supporting pie charts, is technically equivalent to 1-2-3.

But, with its powerful worksheet-linking and goal-seeking operations, it goes well beyond 1-2-3. Once ATI adds Gantt charts to the time-scheduling feature, 20/20 will be one of the most sophisticated integrated packages anywhere.

ABOUT THE BENCHMARK

Product evaluations, specifications and technical information are provided by Yates Ventures, Inc. Software Evaluation Laboratory Service (Sels), which is solely responsible for their accuracy. For more information about Sels, contact Yates Ventures, Suite 201, 3350 W. Bayshore Road, Palo Alto, Calif. 94303.

WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

DOD sets computer match to detect agency abuse

WASHINGTON, D.C. — The U.S. Department of Defense recently announced it will conduct a computer match of its personnel records with records from the Veterans Administration to detect any debtors to the federal government or abuse of agency programs.

The computer match is expected to identify people who wrongly obtain veterans' benefits at the same time they are being paid by the military reserves, according to a Defense Department notice.

Other computer matching programs reported by federal agencies included the following:

- ■ The U.S. Department of Labor and the Office of Personnel Management will perform a computer match to identify people who wrongly obtain civil service retirement benefits while receiving workers' compensation payments.
- ■ The U.S. Department of Agriculture (USDA) said it will use computer matching in two programs to reduce its unemployment and workers' compensation costs. One program will share USDA personnel files with state labor officials to identify people ineligible for unemployment benefits; the other will identify USDA employees who are currently receiving workers' compensation and who could be rehabilitated.

Audit finds Indian bureau's DP operations ineffective

WASHINGTON, D.C. — The U.S. Bureau of Indian Affairs has not effectively managed its DP operations, according to a recent audit by Congress' General Accounting Office (GAO), which said the bureau's DP operations are plagued by overlapping information systems and unused equipment.

Bureau officials responding to the report said they have created a new Office of Data Systems to strengthen the bureau's hardware and information systems development management.

The GAO reported that the bureau did not have an inventory of its computer hardware and that many microcomputers, word processors and terminals have not been used since their purchase because local offices had no space, use or software for the equipment. The auditors said 326 of the 1,325 pieces of DP equipment studied by the GAO were unused items and were being leased at a cost of $687,000 a year.

The bureau does not have a centralized means of coordinating systems development efforts, the GAO said, resulting in the development and maintenance of at least nine duplicative or overlapping information systems by the bureau.

Tax reform legislation, industrial policies needed

WASHINGTON, D.C. — Tax reform legislation that eliminates tax credits for businesses should be coupled with industrial policy legislation that provides targeted financial subsidies for preferred industrial investments, U.S. Rep. John J. LaFalce (D-N.Y.) said at a recent press conference.

For example, if the 25% tax credit for research and development expenditures is killed, it should be replaced by direct government payments to stimulate research, according to a staff report he released.

LaFalce said the present corporate tax code is tantamount to an industrial policy because it provides numerous subsidies for particular industries but does so inefficiently and without a coherent strategy.

"It would be far better for our overall economic prosperity to provide such assistance through direct [spending] programs which are better targeted, more flexible and more conditional than tax policies," he noted. "Therefore, I believe that we must try to move toward reform of both the tax code and more explicit industrial policies at the same time."

LaFalce released a study titled "The Tax Code as Industrial Policy" and said his House Subcommittee on Economic Stabilization will hold hearings on the subject in 1985.

Seminars focus on performance

TORRANCE, Calif.— The first of three programs exploring performance measurement systems and contract requirements will be held Jan. 24-25 at the Sheraton Twin Towers in Orlando, Fla.

Sponsored by the Technology Transfer Society, "Advanced Program Control Techniques" is designed for government and private contractors specializing in aerospace, defense, electronics and energy.

The seminar will be conducted by Gregory Maust, director of the financial and management systems division at Doty Associations, Inc., a Washington, D.C., consulting firm.

The program will also be held Jan. 28-29 at Resorts International in Atlantic City, N.J., and Jan. 31-Feb. 1 at Marriott Twin Bridges in Washington, D.C. Program registration costs $525 per registrant, or $495 for government personnel, university staff and teams of three or more. More information is available from TTS Seminars, P.O. Box 3608, Department APCT, Torrance, Calif. 90510.

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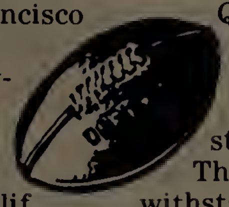
Miami Dolphins mix might with byte for bowl battle

Micros abbreviate method used in '60s, according to Hall-of-Famer Tittle

By John Desmond
CW Staff

MIAMI — Patty Daley is not a true football fan, but her input will be critical to the Miami Dolphins' game plan in next Sunday's Super Bowl matchup with the San Francisco 49ers in Palo Alto, Calif.



Daley enters the play-by-play data of the Dolphins and their opponents into the Dolphins' computer system from MDS Qantel of Hayward, Calif., and the system generates reports used to devise game strategy.

The Dolphins, the second team (after the Tampa Bay Buccaneers) to use Qantel's Sports Pac program, have run it on a Qantel System 40 minicomputer for five full seasons.

The Miami Dolphins' controller, Howard Rieman, said that Head Coach Don Shula was once asked whether the Qantel system allowed his coaches to get to bed earlier. NFL teams typically view three game films of their upcoming opponents. The previous Sunday's game is usually viewed late into Monday night. "No, it just gave them more time to look at film," Shula reportedly said.

Reports generated for both teams

The coaches fill out a form for every play in the game, listing every relevant fact, including position on the field, downs, yards to go for first down, play called and result of play. The same thing is done for defense and even for the team's own offense to make sure the team is not blind to its own tendencies. In Miami's case, Daley keypunches information from the form into the Qantel system, and reports are generated from the information.

For the Super Bowl, reports will be generated on the opponent's offense and defense based on the game films and and on scouting reports from the coaching staff. "Before, they had to do that by hand. Now, they get the information much faster," Daley said of the system.

The 49ers also use Qantel hardware, but the San Francisco team uses its own software. No one from the 49ers could be reached for comment on the system.

Trick plays a separate factor

One has to wonder whether trick plays such as those in the 49ers' Jan. 6 confrontation with the Chicago Bears, when 49er quarterback Joe Montana lined up at left end or when a 49er guard lined up in the backfield, would confuse the Qantel system. According to Daley, "The computer doesn't know anything about [a trick play]. It'll just be inputted." According to Rieman, "There's a category for stunt plays."

The computer-generated reports are used less and less as game day approaches. Bob Griese, a 14-year football veteran, former Dolphin quarterback and for the past three seasons an NBC-TV football commentator, said,"We would use them during the week, and that's when we formulated a lot of our thinking about what the other team was doing. But we didn't use them during the game."

According to Qantel spokesmen, both teams in the upcoming as well as the previous three Super Bowls have been Qantel users. Does this indicate a relationship? "We'd like like to think so," was the Qantel response from Billy Hicks, customer support manager. In a semicoup for Qantel this year, the Dolphins will have Qantel hardware installed in their headquarters at the Hyatt Regency hotel in Oakland, Calif., to provide instant access to programs.

The high-tech intrusion notwithstanding, professional football is not threatening to become as programmed as a video game. In Rieman's view, "The guy who invented Astroturf did more damage to the game than the guy who introduced computers."

'Almost the same as the '60s'

Despite the application of modern technology to this most physical of sports, Hall of Fame quarterback Y.A. Tittle told *Computerworld* that his New York Giants team in the 1960s was doing almost the same thing computers are doing in football today. According to Tittle, who played from 1948 to 1964 for the Baltimore Colts, the 49ers and the Giants, the Giants were calculating opponents' tendencies in the early '60s. "When I was playing, we had to do it longhand. Now, they do it much better and much faster," he said.

Currently in the insurance business in Palo Alto, Calif., Tittle noted that if a team does something in a game that it has not done in the previous eight games, the opponent may be required to adjust with something equally as unexpected. The coaches may have to go right off the tendency charts. "Computers are a big aid, but they don't make everything foolproof," Tittle noted.

And regardless of her impact on the results on game day, the Dolphins' keypuncher, Daley, said, "I'm not really into football."

"We can't afford to lose data! That's why we bought insurance... Data Check Recovery."

Merv Hemp, Systems Programmer, CADAM, Inc., Burbank, CA

"Before we got Data Check Recovery, we more or less threw up our hands in desperation when we had an I/O error – all that pack analyzing, reinitialization, restoring. It all takes time; it's cumbersome.

"Since we installed Data Check Recovery, I've cut down the amount of time I spend on those problems.

"Historically, we've had quite a few problems with data checks on the 3380 packs we use on our MVS system. And as a software R&D firm, being able to get at the latest version of our software is critical to us; having to devote programmer time to correcting DASD errors is wasteful.

"So we bought Data Check Recovery as an insurance policy. And it's paid off.

"For instance, one morning the SYSLOG data set indicated data checks had occurred during the nightly backup of the packs. All I had to do was take the information from the error message and plug those parameters into the DCR procedures – and what could have been a permanent disaster became a very minor inconvenience.

"Data Check Recovery is so easy to run that operations will soon run it themselves, without having to check with the systems group.

"DCR is our first line of defense against disk I/O errors. And it just keeps paying for itself."

Data Check Recovery is a powerful, dependable utility that recovers data that has become unreadable due to permanent I/O errors – hard data checks, track overruns and several types of equipment checks. Data Check Recovery supports all OS operating systems.

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Software Corporation of America

PRODUCT SPOTLIGHT

Realities of data integrity, security, utility confront

By Paul Korzeniowski
CW Staff

In many corporations, a microcomputer data base management package resembles a Pandora's box filled with questions concerning data integrity. The rapid acceptance of microcomputers placed microcomputer data base management systems (DBMS) in corporations before the firms had carefully examined how these packages could best be utilized. Clear guidelines for determining when an employee should use a mainframe data base manager instead of, or in conjunction with, a microcomputer package have yet to be established in most cases.

"Microcomputer data base management packages raise a myriad of questions," said Martin Levin, president of Levin & Associates Corp., a Colorado Springs, Colo., consulting firm. "In some companies, users are downloading data and duplicating a mainframe data base. The user may then copy the data and give it to a manager in another department.

"This scenario raises security and control issues," Levin continued. "Who monitors downloading? What data is stored on a microcomputer? What is kept on a mainframe? Whose responsibility is it to ensure that mainframe updates are downloaded? How will the user track different versions of the data? How reliable is the data? Most corporations are skirting these issues."

Most companies have thus far been able to skirt these issues without opening the proverbial Pandora's box because, in corporations, widespread use of micro data base management packages is the exception rather than the rule. "Out of our 200 microcomputer users, approximately five require a stand-alone microcomputer data base manager," noted Vita Cassese, director at the Pharmaceuticals Systems Division of Pfizer, Inc. in New York.

Ignore data integrity

Other corporate microcomputer adminstrators' estimates supported Cassese's numbers. With few employees working with these packages, corporations have, for the moment, chosen to ignore data integrity questions.

However, managers added that recently the number of employees requesting these functions has steadily increased. Many companies have reached a crossroad: Address microcomputer data base management issues now or later face the plagues, sorrow and mischief they can unleash.

Cassese and other managers listed three reasons why few employees are currently working with microcomputer data base management packages: Some employees are content with mainframe data base management systems; current microcomputer users do not require data base management capabilities; and until recently, most microcomputer packages were rather limited.

Mainframe data base management packages have been available for years. Consequently, corporate users who required data base management capabilities turned to mainframe or minicomputer packages before microcomputers were conceived. "We have a number of users who are loyal to a mainframe data base management package," maintained Timothy Aston, office system analyst at Bank of New England in Boston. "Yet even they realize that some functions are more suited to a microcomputer than a mainframe."

Also, microcomputers are a relatively recent phenomenon, and few employees have had sufficient time to become expert microcomputer users. "Most of our users have been working with micros for less than a year," said Karen Fredericks, consultant at General Motors Corp. in Detroit.

Because of this inexperience, users are content with the data base facility that an integrated package such as Lotus Development Corp.'s 1-2-3 provides. "Many of our employees have Lotus 1-2-3 and do not even know they are working with a data base," Aston noted.

As time passes, these workers become familiar with data base management capabilities. "Data base managers possess a longer training curve than other applications," Levin noted. "A spread-

SELECTED MICROCOMPUTER DATA BASE MANAGEMENT PACKAGES

Vendor	Ashton-Teta	Ashton-Tata	Dayflo, Inc.	Hayes Microcomputer Products, Inc.	Information Builders, Inc.
Product	*Dbase II*	*Dbase III*	*Dayflo*	*Please*	*PC Focus*
Operating system	MS-DOS 1.1; CP/M 80; CPM/M 86	PC-DOS 2.0	PC-DOS 2.0; MS-DOS 2.02	PC-DOS 1.1	PC-DOS 2.0; MS-DOS 2.0
Minimum disk drive requirement	Dual floppy	Dual floppy	Hard disk	Dual floppy	Hard disk
Maximum number of fields/records	32	128	Unlimited	99	255
Maximum number of characters/field	254	254	32,000	999	255
Maximum number of records/file	65,535	1 million	65,000	16 million	Unlimited
Maximum number of characters/records	1,000	4,000	32,000	2,000	4,096
Imports file	Ascii, DIF	Ascii	Ascii, Dbase II, PFS	DIF, Ascii	Ascii
Exports in file format	Ascii	Ascii	Ascii, Dbase II	DIF, Ascii	Ascii, DIF
Spilt and merge files for reports	Yes	Yes	Yes	Yes	Yes
Maximum number of field sorted in a report	1	7	10	5	32
Encrypts data	No	No	No	No	Yes
Provides password feature	No	No	No	Yes	Yes
Provides activity log	No	No	No	No	No
Provides query language	Yes	Yes	Yes	Yes	Yes
Minimum memory required	48K	256K	320K (512K recommended)	128K	512K (640K recommended)
Price	$495	$695	$495	$349.95	$1,595

SELECTED MICROCOMPUTER DATA BASE MANAGEMENT PACKAGES

Vendor	Micro Data Base Systems, Inc.	Microrim, Inc.	Powerbase Systems, Inc.	Software Solutions, Inc.	SSR Corp.
Product	*Knowledgeman*	*R:base 4000*	*Powerbase*	*Dataease*	*Omnifile*
Operating system	PC-DOS 2.0, MS-DOS 3.0, CP/M 86	PC-DOS 2.0, Ctos 8.0	PC-DOS 1.1	PC-DDS 2.0	PC-DOS 1.1, MS-DOS 1.1
Minimum disk drive requirement	Dual floppy	Dual floppy	Dual floppy	Dual floppy	Dual floppy
Maximum number of fields/records	255	400	64	255	64
Maximum number of characters/field	65,535	1,530	80	255	1,828
Maximum number of records/file	65,535	Unlimited	65,000	65,535	16 million
Maximum number of characters/records	65,535	1,530	1,600	4,000	116,992
Imports file	Ascii, DIF, Basic	Ascii, DIF, Sylk	DIF, Sylk, Ascii, Multimate, WKS, Dbase II, PFS	DIF, Ascii, Multimate, Dbase II	DIF, Ascii
Exports in file format	Ascii, DIF, Basic	Ascii, DIF, Sylk	DIF, Sylk, Ascii, Multimate, WKS, PFS, Dbase II	DIF, Ascii, Multimate, Dbase II	Ascii, DIF
Spilt and merge files for reports	Yes	No	No	Yes	Yes
Maximum number of field sorted in a report	255	10	5	255	10
Encrypts data	Yes	No	No	No	No
Provides password feature	Yes	Yes	No	Yes	Yes
Provides activity log	No	No	No	No	No
Provides query language	Yes	Yes	No	No	No
Minimum memory required	192K	256K	256K; 320K for PC-DOS 3.0	192K	128K, DOS 1.1; 192K, DOS 2.0
Price	$500	$495, PC-DOS; $795, Ctos	$395	$600	$425

CW CHARTS

All packages shown run on the IBM Personal Computer and some have versions for other microcomputers. File managers are not included.

Dbase III piques firms' interest

Ashton-Tate's Dbase II has ruled the microcomputer data base management system (DBMS) industry in the same way that Lotus Development Corp's 1-2-3 reigned in the integrated application arena. Ashton-Tate estimates that close to a quarter of a million people purchased the package.

But Dbase II does not seem to have a foothold in many large corporations. "We have only one department that works with Dbase II," noted Timothy Aston, system analyst at Bank of New England in Boston.

Aston's sentiments were echoed by other microcomputer managers who claimed that Dbase II was too difficult to use. The package includes a programming language and requires that end users design their own applications. "I don't think that a user should have to learn how to program to use a data base management package," said Frank P. Chiacchieri, another system analyst at Bank of New England.

George Chetel, manager of data services at Gillette Co. in Boston, added that a DBMS program should be easy to use instead of requiring programmer expertise.

Earlier this year, Ashton-Tate introduced Dbase III, which added a user-friendly interface and other enhancements to Dbase II. "Dbase III has alleviated the ease-of-use problems present in Dbase II," said Dan Spiner, chief operating officer at Management Information Software Co., a New York value-added distributor. "Its Assist function helps novice users design applications."

The Dbase III announcement has spurred interest in the package."We may recommend Dbase III," said Vita Cassese, director at New York-based Pfizer, Inc.'s Pharmaceuticals Systems Division. "It may be able to combine powerful relational capabilities with ease of use. But we have just begun testing it."

myths regarding data base management packages

sheet is a relatively simple concept to grasp. After working with one for a few hours, users realize the benefits it offers. But it takes much longer for [them] to understand how to manipulate a data base manager.''

When employees understand how to manipulate these packages, they notice limitations to a package like 1-2-3. According to Dan Spiner, chief operating officer at Management Information Software Co., a New York-based value-added distributor, integrated packages do not offer comparable features of the stand-alone versions.

DBMS vs. file manager

The integrated packages typically offer a file manager rather than a data base manager. File managers possess limited query capabilities. When a user searches for an item, a file manager examines complete records rather than single fields. For example, if a user was searching for information on an employee with the last name Taylor, a file manager would search the fields First Name, Last Name, Address, City and State. A data base manager would just examine the field Last Name.

File managers are ideal for creating mailing lists and for monitoring a small amount of data, but they are inadequate for other functions, microcomputer administrators claimed. Searching through an entire file by record rather than by field wastes time — especially when the file is large.

Another limitation to file managers is that users can only work with one file at a time. As employees work with a file manager, they will construct a number of different files. Often, data overlaps in various files.

For example, one file may contain a list of the employees with microcomputers. A second file may list employees with software packages. An auditor may want to link the two files. With a file manager, users would have to create a third file from scratch. With a data base manager, the user can typically generate a third file with a join command.

At least 150 micro DBMS packages

As microcomputers became more powerful, the number of packages offering data base management capabilities increased. ''A few years ago, the inability to link multiple files was a chief limitation to microcomputer data base management packages,'' said Spiner of Management Information Software. ''But today, that is no longer the case. There are plenty of packages with powerful data base management features.''

Today, there are at least 150 micro DBMS packages on the market. To differentiate their products, vendors often tout the number of records a user can place in a data base or the number of fields for each record.

For example, Dayflo, Inc. claims to offer an unlimited number of fields for each record, and Information Builders, Inc.'s PC Focus boasts an infinite number of records for each file in a data base.

Too much storage?

Users question the value of these claims. ''Most of our users only need 5K to 10K [bytes] to store their records,'' said Gregory Chetel, manager of data services at Gillette Co. in Boston.

According to Spiner, ''The software capabilities have surpassed those of the hardware. Offering a million or a billion records in a data base is just absurd.''

Aston stated that most packages support a data base large enough for the average user. ''Whenever there has been a problem, it was usually a hardware limitation — insufficient [random-access memory] or disk space,'' he said. ''Never has a user told us that he needed a new package because his 65,000 record data base was filled.''

While most managers downplayed vendors' size claims, a few managers did mention instances where size was a selling point. ''We need a package that supports 256 fields for each record,'' Gillette's Chetel said. ''We worked with a package that allowed only 64 fields, and it did not meet our needs.''

Rather than the size of fields or number of records, managers re-

See **DBMS** page 16

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DBMS from page 15

soundingly named ease of use as the key criterion when choosing a package for their companies. "Most end users are not sophisticated microcomputer users; they are principally financial brokers," Bank of New England's Aston stated. "We do not have the staff to provide full-time support to them. So, we look for easy-to-use packages with on-screen documentation and Help keys and screens. The package has to support itself to an extent."

Two packages that Aston's group chose, Powerbase Systems, Inc.'s Powerbase and Software Solutions, Inc.'s Dataease, were cited by other managers. "We chose Dataease because of its ease of use," Chetel said. "Our users can create a production model simply and easily without having to spend a lot of time learning the package."

Packages like Powerbase and Dataease are easy to work with, users said, but they do not possess powerful programming languages. A data base management programming language is similiar to Cobol or Fortran and allows a user to write his own application. Ashton-Tate's Dbase II is the package best known for its programming language.

A powerful programming language is a key purchase consideration in some corporations. "We have been using Dbase II for a few years and are now recommending that users purchase Dbase III," said Neil Cookrish, product manager at Bankers Trust New York Corp. "Dbase II possesses a very powerful programming language that allows us to tailor our applications."

Other managers question whether DBMS packages with programming languages should be given to end users. "I don't think that a user should have to learn how to program to use a data base management package," said Frank P. Chiacchieri, system analyst at Bank of New England.

David Ferris, president of Ferrin Corp., a San Francisco consulting firm, added, "A number of data base management packages are being misused. Most end users are naive and believe that they have the skill to design their own applications. Vendors' claims bolster this belief. Users see products like [Information Builders'] PC Focus and Dbase II as end-user tools. Yet most users lack programming and system analysis skills; they just don't know how to design, test or document system development."

Some corporations attempt to solve this problem by staffing an in-house support team whose responsibilities include writing these types of applications.

Often, this solution creates other problems. "Rather than system development being placed in a mainframe development queue, it is placed in the micro development queue," Levin said. "No matter where it is placed, few companies have the resources to design additional applications. Usually, they have to hire contractors to write the applications."

Allocation of resources is one issue that corporations may soon have to address. Interest in stand-alone micro data base management packages is swelling. "Data base managers represent a rapidly growing area in our company," GM's Fredericks noted. "It is an area where people want more information. Users are not sure how to use a mainframe and are concerned that a mainframe package may be overkill. They are looking for the right mix of microcomputer and mainframe capabilities."

Mixing these capabilities opens Pandora's box. Microcomputer administrators report that micro DBMS security features are relatively

See **DBMS** page 17

WHAT'S DIFFERENT?

A number of vendors were asked: What feature differentiates your company's data base manager from its competitors? The following are their responses.

Ashton-Tate's *Dbase II*

[Dbase II] consists of a complete programming language that allows a user to write his own applications.

Ashton-Tate's *Dbase III*

Dbase III adds a user-friendly Assist function to Dbase II programming language and helps a user construct an application.

Dayflo, Inc.'s *Dayflo*

Dayflo is a free-form, word-oriented data base that does not require that all records or fields be one length.

Hayes Microcomputer Products, Inc.'s *Please*

A user is able to use Please with other products, since it contains facilities that allow one to exchange Dbase II and [Data Interchange Format] files.

Information Builders, Inc.'s *PC Focus*

Because Focus runs on different types of hardware, a user is able to choose what type of machine is suitable for an application and run the application on that machine without learning a new set of commands.

Micro Data Base Systems, Inc.'s *Knowledgeman*

The product's versatility is its key feature: A user can add spreadsheet, graphics and other modules.

Microrim, Inc.'s *R:base 4000*

[R:base has] optional prompts that allow the user to construct an application by responding to fill-in-the-blank questions.

Powerbase Systems, Inc.'s *Powerbase*

The Zoom function allows a user to move easily from one file to another.

Software Solutions, Inc.'s *Dataease*

[Dataease] is a fully relational data base that is completely menu-driven.

SSR Corp.'s *Omnifile*

[Omnifile] is flexible and allows a user to add and change fields and records as he works.

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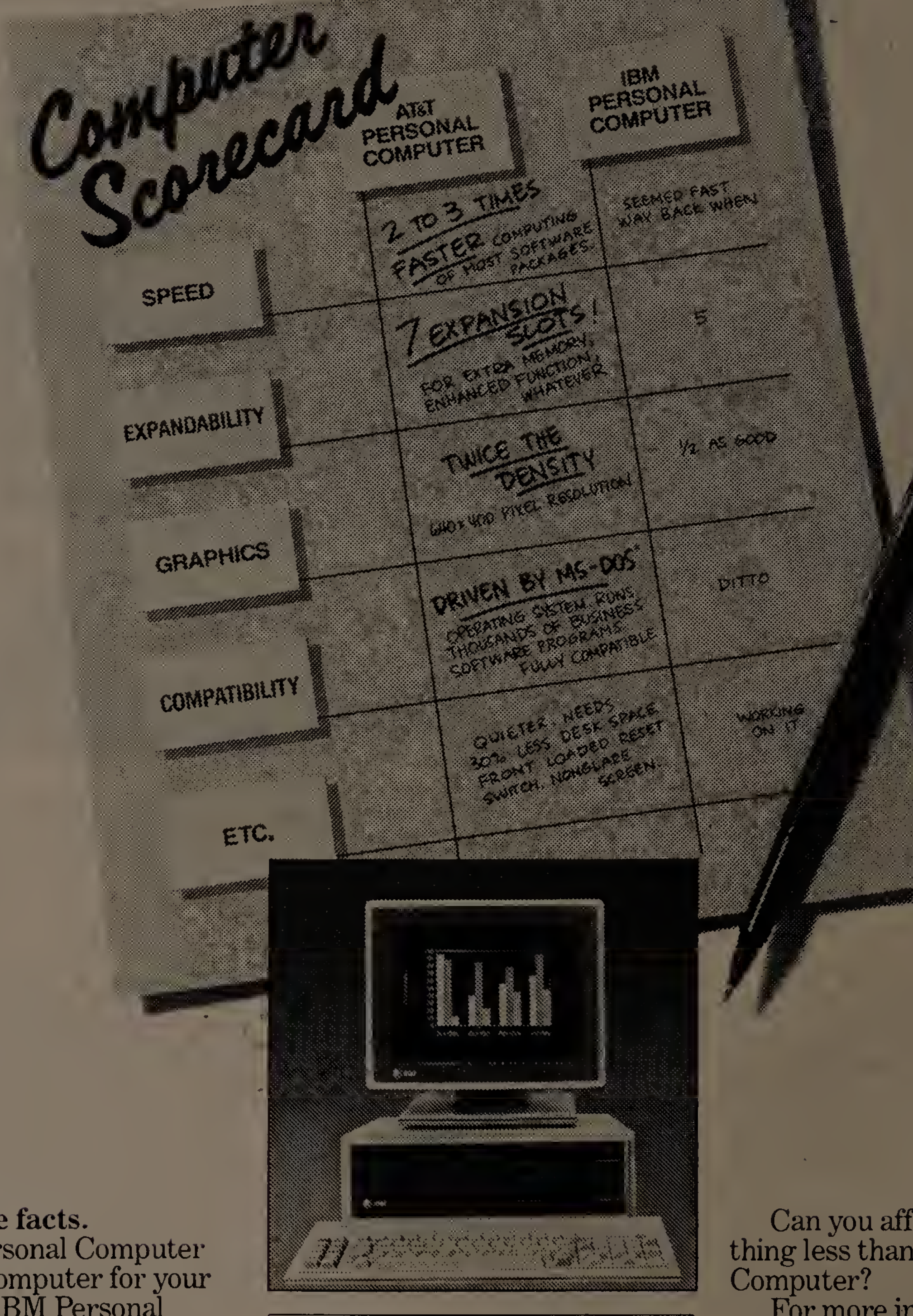
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Retailers' MIS expenses up 18% in 1983, study reports

NEW YORK — MIS costs for retailers jumped to $652 million in 1983 (0.92% of sales) for mass merchandisers, department, specialty and grocery/combination stores participating in a survey conducted by Arthur Young & Co., an accounting and consulting firm here.

This is an 18% increase from 1982 figures and higher than the retailer's 16% increase in sales, the third annual study, "MIS Expenses in Retailing," reported.

The study of 111 retailers reveals a significant drop in the amount they are budgeting for MIS payroll (from 0.52% of sales in 1982 to 0.39% of sales in 1983). Forty-seven percent of the participants reported the recent completion of point-of-sale (POS) systems, and 48% of the retailers reported plans to develop or improve POS and purchase order management systems.

Computers operating in the store — rather than in headquarters — were developed by 47% of the mass merchandisers, and sales reporting/analysis systems were developed by 46% of the department stores, the study said.

Half of the retailers indicated plans to implement inventory control and stock replenishment systems during the next two years, according to the study.

Industry attracted to micros

The retail industry continues to be attracted to microcomputers. On the average, store owners reported that they had 50 microcomputers installed in their organizations. Half of the retailers use microcomputers for financial planning. A third of the grocery and combination stores and a quarter of mass merchandisers use microcomputers for sales reporting and analysis. Three-fourths of all retailers include microcomputers in their overall MIS plan.

Eight out of 10 retailers reported that they have annual written plans for MIS activity, and 71% of the participants have established a data processing steering committee to coordinate MIS with corporate strategy and to disseminate information to other areas of the organization.

The study is available at no cost. More information is available from Arthur Young, 277 Park Ave., New York, N.Y. 10172.

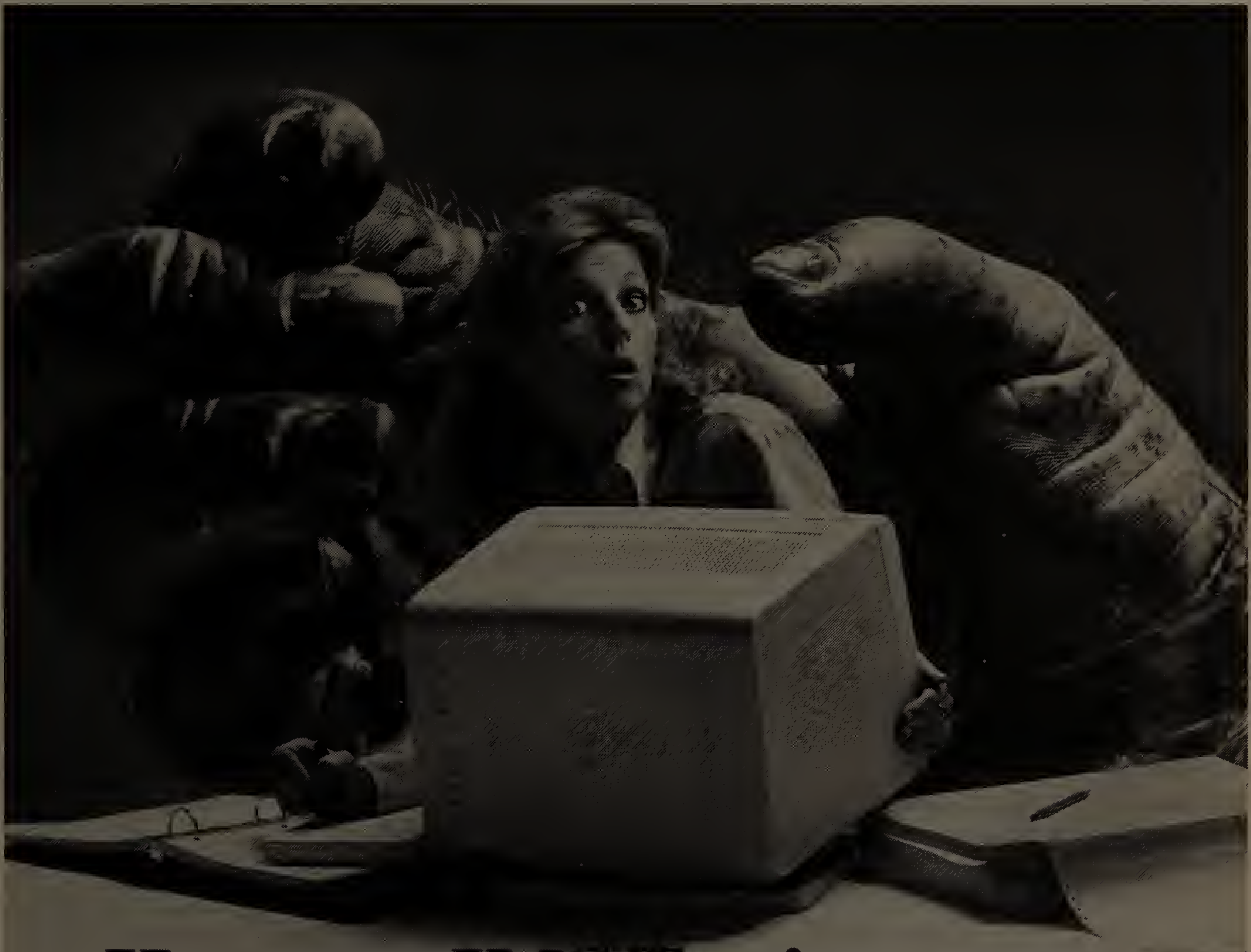
DBMS from page 16

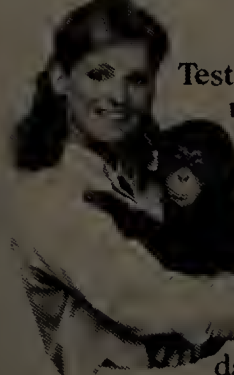
weak. "It is not only managers who are concerned with security problems; users are becoming aware of these issues," Ferris said.

Micro vendors, aware of the weakness, have recently begun to incorporate security features similar to those on mainframes into their packages. A number of packages offer password protection and data encryption. However, few packages offer an activity log, essential in larger systems.

Until these features are common, Levin recommended that microcomputer data base management packages be used sparingly and carefully.

"One company was running four monthly batch systems to produce reports for four departments," he said. "It altered the system so that a batch run produced a file in Dbase II format. A copy of the file was given to each department that produced its reports. That is a suitable application for a microcomputer data base manager. Unfortunately, there aren't many companies that have put that much thought into the use of these packages."





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Study reports telecommuting boosts work quality

By Donna Raimondi
CW Staff

ITHACA, N.Y. — Rural, suburban and small-city workers are more apt to telecommute than their city counterparts, according to a 1984 study by a Cornell University professor, even though the likelihood for employment without telecommuting is roughly the same for employees in these areas.

Increased quantity and improved quality of work was reported, and turnover and absenteeism problems appear to be reduced under telecommuting arrangements, according to the study titled "Expanding the Boundaries of Work: Research on Telecommuting" by Charles McClintock of Cornell's College of Human Ecology here.

Among respondents who have access to electronic mail and message systems, routine work tasks were handled more efficiently, and it was possible to direct an uninterrupted effort on some of the more complex work tasks, the survey reported.

Telecommuter prototype

The typical telecommuter is a 40-year-old man who is self-employed as a consultant, manager or writer, the study said.

Of men and women who telecommuted, 15% of each was company-employed only, and 22% of the women and 38% of the men were both company- and self-employed, according to the study.

The study was based on 18 interviews and 140 mail questionnaires on self-employed and company-employed individuals who work at home using computer technology. It represents a variety of demographic, household and work situations in the U.S. and Canada.

Among the data processing-related jobs performed by telecommuters in this study were programming, computer staff specialist, software development, custom programming and systems design.

> *The typical telecommuter is a 40-year-old man who is self-employed as a consultant, manager or writer.*

Focus on employer business

Approximately one in 10 respondents spent his telecommuting time exclusively on employer business, the report showed.

While most respondents were employed in professional or managerial jobs, women were three times as likely as men to be in nonprofessional positions (18% vs. 5%), the study said.

On a scale of -2 to +2, showing the influence of telecommuting's affect — -2 being a decreased influence, zero representing no influence and +2 representing increased influence — respondents, by gender, perceived that telecommuting had increased feelings of control over their work (1.14 total), with women claiming an increase of 0.97 and men claiming an increase of 1.21.

All workers said they felt their chances for promotion were greater (0.19), with women feeling more of an increase in chances of promotion (0.28) than men (0.16), the study revealed. Feelings of satisfaction with work were increased (1.18 total), with men feeling more of an increase in satisfaction (1.20) than women (1.13). There was an overall decrease (-0.57) in feelings of work-related stress, with men feeling more of a decrease (-0.64) than women (-0.42).

Respondents' schooling, age range

Forty-four percent of those surveyed held postbachelor's degrees, and the ages ranged from 19 to 67 years.

Telecommuters had worked at home for an average of 2.2 years (with a range of one to 15 years), the study said.

The study is available for $1.60 per copy from Charles McClintock, College of Human Ecology, MVR-N135, Cornell University, Ithaca, N.Y. 14853.

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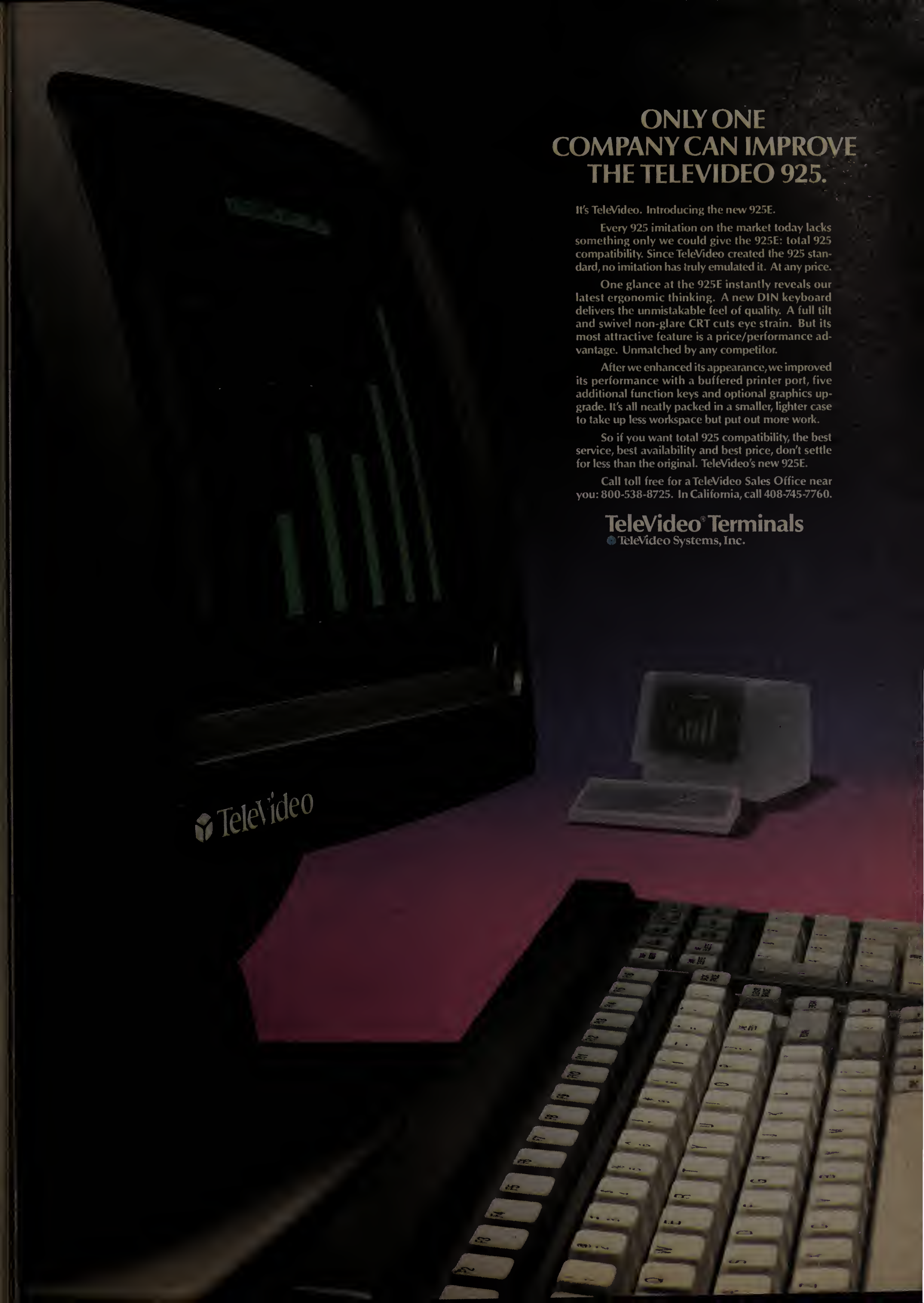

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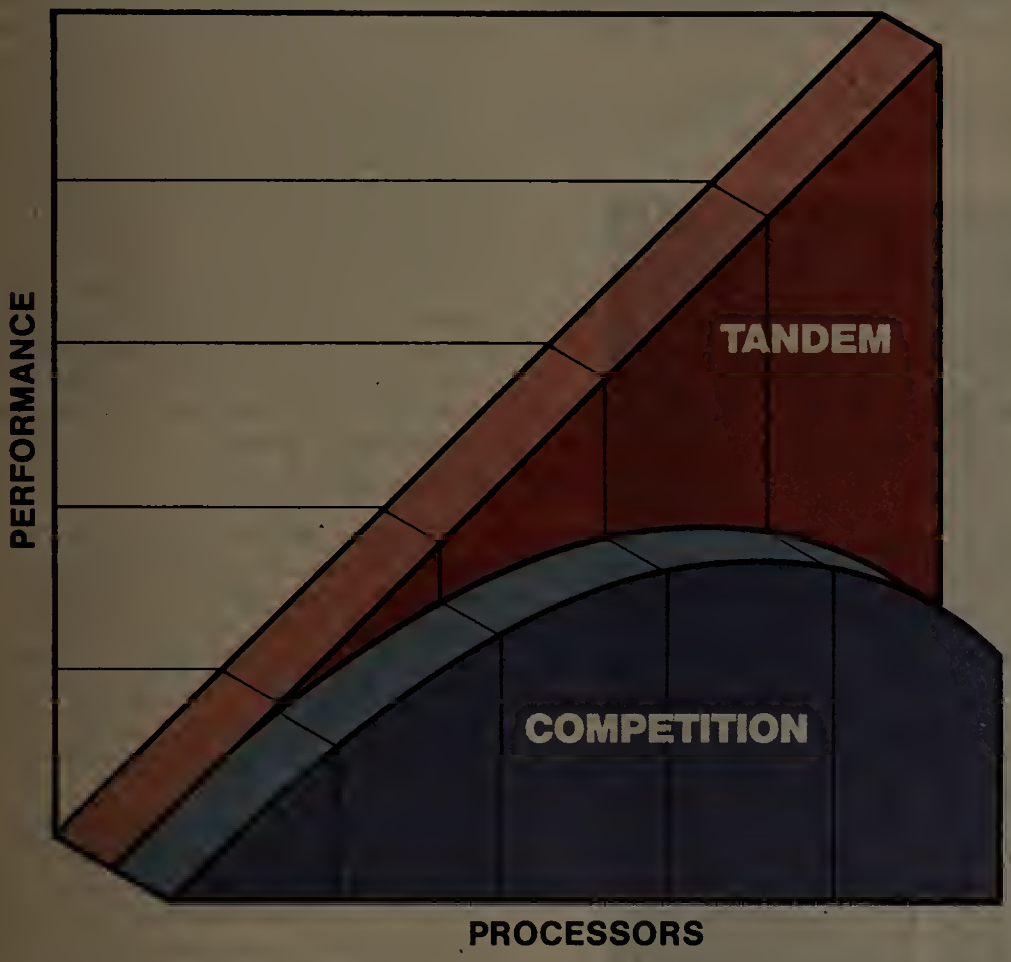

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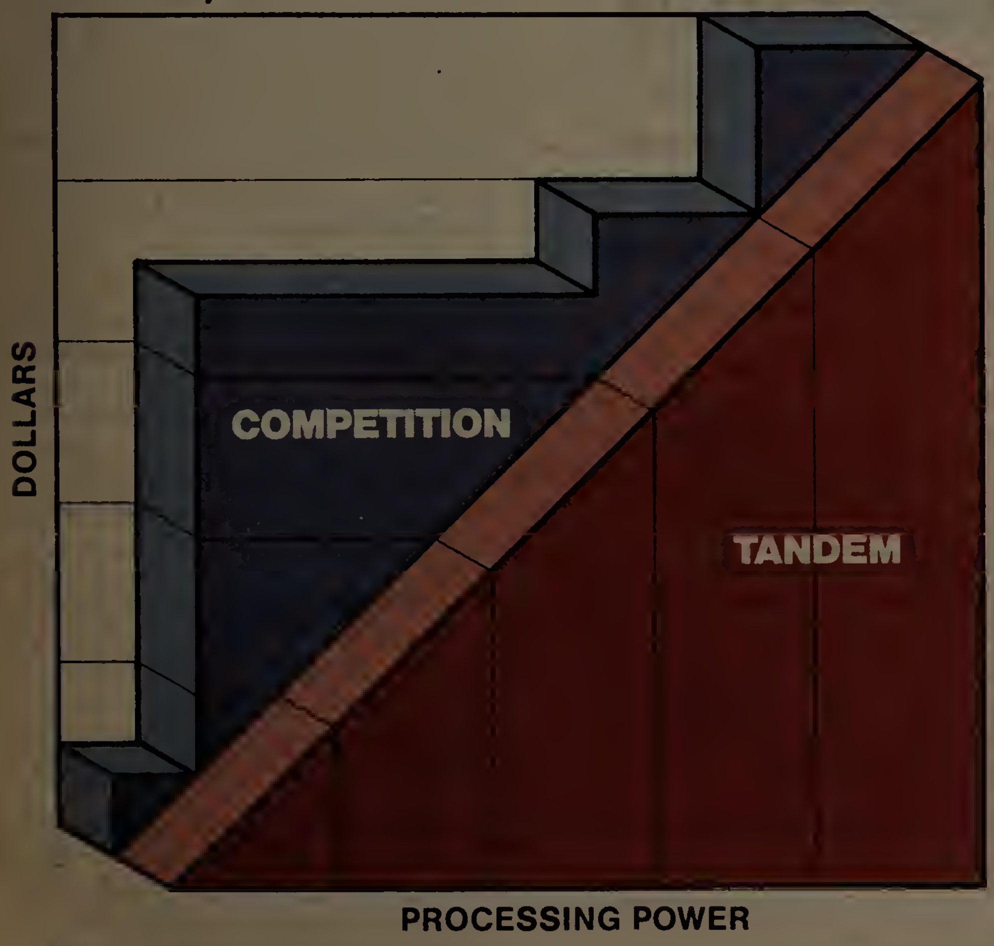

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TANDEMCOMPUTERS

HP launches transportable, Unix-based Integral micro

By Eric Bender
CW Staff

CORVALLIS, Ore. — Hewlett-Packard Co. last week introduced the Integral Personal Computer, a 25-lb, transportable system that runs the company's version of AT&T's Unix.

Priced at $4,995, the system is aimed primarily at technical professionals "who are pushing the limitations of today's 16-bit personal computers," said Cyril Yansouni, vice-president and general manager of HP's Personal Computer Group.

Designing the system in a transportable package, "we tried to make sure that people could operate it as their prime computer," said Bruce Foster, product marketing manager. "Many professionals really do have different sites they work at — they're typically set up at one desk, but they also work at home or at client sites."

HP officials also emphasized the machine's Unix features. Multitasking capabilities will be particularly useful for professionals who typically are interrupted often and "generally work with multiple things at any one time," Foster said. Working on Microsoft Corp. MS-DOS-based micros, these users "spend a lot of time in starting up and shutting down those applications," he said. "On the Integral, you simply have all those things running at once."

HP's Integral Personal Computer

Access to Unix-based software development tools and choices among a growing number of application packages are other important benefits, the officials said.

The Integral, which unlike most Unix systems lacks a hard disk drive, incorporates the kernel of the vendor's HP-UX Unix-based operating system in read-only memory (ROM). The system's 256K bytes of ROM also includes a Personal Applications Manager shell designed to isolate users from Unix commands. In addition, a window manager for handling multiple applications simultaneously is embedded in ROM.

Based on the Motorola, Inc. 68000 microprocessor, the Integral features 512K bytes of user random-access memory (RAM) that can be expanded to 1.5M bytes, 32K bytes of display RAM, a 16-bit graphics processor, a 9-in. amber display with 512- by 255-pixel resolution, a 3½-in., 710K-byte microfloppy disk drive, a built-in HP Thinkjet printer, a full-size keyboard, two I/O slots and the HP-IB expansion interface. Bundled software includes an HP-UX commands disk, a utility disk and a "standard applications" disk.

'Classic HP machine'

"It's a classic HP machine — beautifully designed and elegantly put together," noted Chris Christiansen, senior analyst with the Yankee Group in Boston. He said that while putting the operating system into ROM was not a first, "what is remarkable is HP's job of condensing Unix."

Other analysts also applauded the system design but agreed that the Integral is likely to sell to a relatively limited audience, primarily within HP's currently installed base.

Peter Marvit, manager of laboratory services at Yates Ventures, Inc. in Palo Alto, Calif., noted that HP's sales pitch seems directed toward replacement sales for the HP Series 80.

Marvit called the single microfloppy drive "a significant drawback," saying that users will be forced to swap disks frequently. However, a RAM disk function is built into the Integral, and Foster maintained that running typical applications will require little swapping. He added that HP hard disk drives, offering up to 55M bytes of storage, can be attached via the Integral's HP-IB port.

Options offered

Among options for the new system are an additional 512K bytes of RAM for $1,495 or a 256K-byte RAM enhancement, priced at $695. A bus expander providing up to five additional slots will be available by midyear for $1,495; the expanders permit system memory expansion to 5.5M bytes.

I/O cards include an RS-232 interface ($195), a 300 or 1,200 bit/sec modem (available by midyear for $595) and four other interfaces designed primarily for instrumentation control. An HP mouse is available for $195.

Optional software includes HP-UX C language ($295), HP-UX Technical Basic ($295), nine personal productivity applications and a number of computer-aided design packages.

Hewlett-Packard Co.'s Personal Computer Group's Portable Computer Division is located at 1000 N.E. Circle Blvd., Corvallis, Ore. 97330.

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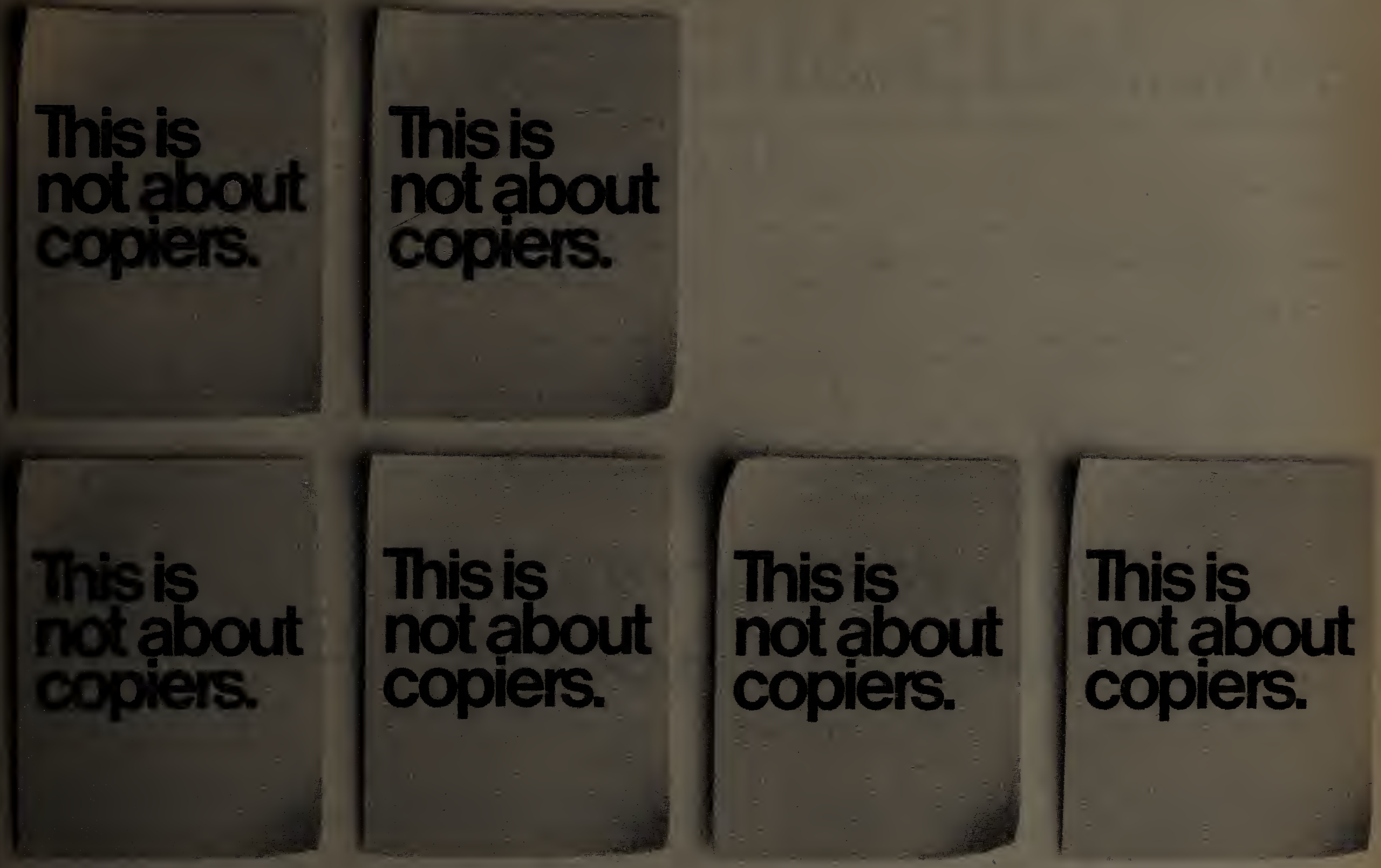
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*Industry report refers to IDC Industry Report

Vendors choose plans to treat rising health care costs

Automaker installs benefits tracking system, timber firm sets up in-house data base

By Donna Raimondi
CW Staff

The skyrocketing health care costs of the past few years prompted Ford Motor Co. to install a computerized medical benefits tracking system in the spring of 1984.

Even to a company the size of Ford, the cost of such a system is not small, but the firm hopes to benefit by modifying its compensation plans to improve the quality of services while slowing the growth of health care costs, Jack Shelton, manager of the employee insurance department at Ford, said.

In 1983, Ford shelled out $742 million in medical benefits for workers employed in its automobile operations, which comes to an average cost of $300 per vehicle produced, Shelton said. In 1980, the average cost per vehicle was $292, and the 1975 cost was only $119 per vehicle, he added.

Ford's rising costs are echoed throughout other large corporations, which are chipping away at employee medical costs using information made available by computerized health care cost management systems. Companies are forcing changes in medical practices that they hope will improve the quality of medical care to their employees and reduce corporate expenses.

Ford installed a health care information system from Medstat Systems, Inc. of Ann Arbor, Mich., in the spring of 1984 with four goals in mind:

- ■ To look at the performance of health care providers.
- ■ To examine the company benefit plans.
- ■ To review how insurance companies administer Ford's programs.
- ■ To study the company's health promotion programs.

"When we tried to analyze the information supplied by our carriers, we found that they hadn't provided good data. It's not timely, and it's in hard-copy form, which makes it not flexible enough to analyze," Shelton said.

The cost of obtaining reports from Ford's insurance carriers was not separated out in the cost for carrier services, Shelton said, so in addition to not getting the quality and frequency of reports that he needed, Shelton said he could not track what the existing reports were costing.

One benefit Shelton has already derived from his Medstat system is an improvement in information that he receives from his carriers — Blue Cross/Blue Shield and John Hancock Mutual Life Insurance Co. of Boston, Mass., he said. The insurers have cooperated with Medstat Systems to furnish the kind of information Ford needed for cost management — as opposed to cost reporting, which they have always provided — he said.

In 1983, Ford shelled out $742 million in medical benefits for workers employed in its automobile operations, which comes to an average cost of $300 per vehicle produced.

In 1980, Boise Cascade Corp. — an Idaho-based timber and paper products company — paid out $53 million in health care costs, a figure that jumped by $10 million in 1981 and that will hit $76 million in 1984, said Richard Strauch, a management consultant for health care cost management.

Strauch said that Boise Cascade figured out that actual medical claims represented about half of its health care expenses, excluding illness pay, dental claims, worker's compensation and other costs.

Boise Cascade called in Health Data Institute of Newton, Mass., two and a half years ago to help set up an in-house data base of health care claims information gleaned from Boise's six major carriers, he said. The data base — developed in SAS Institute, Inc.'s SAS language, is supported by a full-time programmer on Boise Cascade's IBM 3081 Model G under IBM's MVS XA operating system, Strauch said.

From that data base, Boise developed a quarterly health care cost index to determine the average claim amount per covered employee for each of its operating units, Strauch said. The company also set an acceptable annual medical claims growth limit of 7%, he said.

The data base allows corporate management to supply its operating units with information that is directly relevant to them, Strauch said. For instance, if a particular location's data reveals a high incidence of cigarette smoking-related diseases, the

See **HEALTH** page 28

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INTERNATIONAL REPORT

CW International News Network

AUSTRALIA

SYDNEY — Facom Australia Ltd. announced plans to establish a software development center in Sydney following a similar move in New Zealand, resulting in the creation of Fujitsu New Zealand Ltd. A Facom spokesman said the firm intended to create an umbrella organization centered in Sydney to target the Australian software market with particular emphasis on winning government contracts.

■

NEUTRAL BAY — Memorex Pty. Ltd. here said it was doing everything it could to help users who are facing potential problems with their 3380 disk drives.

When original reports spread from the U.S., Australian users learned they were sitting on a time bomb. They discovered that their disk drives may contain faulty disk platters capable of causing a head crash at any time resulting in a complete loss of data. A Memorex spokesman said the company has ceased shipments of the faulty disk drives, and field engineers have been actively rectifying the head crashes caused by the faulty products.

CHINA

NANJING — Several local computer and peripheral makers have been merged here by Zhijin (Venus) Information Industrial Co., to form China's largest computer organization. The company is reportedly equipped to manufacture multilayer printed-circuit boards, microcomputers, printers, VDTs, modems and other communications devices in large volumes.

FRANCE

PARIS — Officials from leading European technology companies met here recently with a number of U.S. vendor executives — excluding IBM — to discuss standardizing their respective product lines to counter IBM's dominance in Europe. The four-day, closed meeting included rep-

HEALTH from page 26

company makes a smoking cessation program available to it, he added.

Boise looks at comparative data from hospitals in a given area and analyzes hospital utilization for various types of admissions. If the information shows that a hospital's average length of stay for a particular procedure is out of line with other area institutions, the company meets with hospital managers to try to effect changes in that area, he said.

Boise Cascade is in the process of converting its 1983 and 1984 data to run on the Medstat on-line decision support system, which will allow analysis as well as reporting capabilities, Strauch said. This system will give the company three data bases to work from: the Boise Cascade medical claims data base; the National Hospital Discharge Survey — a yearly sample of 250,000 hospital discharges from the U.S. Department of Health and Human Services; and the Data Base Consortium, which contains utilization data and comparative statistics detailing hospital and physician costs of all Medstat's clients, he said.

Strauch figured that it would have cost as much to continue development of his in-house system as it will to use Medstat — which charges a flat rate per covered employee per year — and that it was in his company's best interest to support the development of a large, outside data base that he can capitalize on, he said.

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NEWS

resentatives from Sperry Corp., Burroughs Corp., NCR Corp., Digital Equipment Corp. and Hewlett-Packard Co. European firms included Bull, Compagnie Generale d'Electricite, AEG-Telefunken, Inc., GEC, Thomson, Nixdorf Computer AG, Philips, Inc. and Olivetti Corp.

JAPAN

TOKYO — Prime Computer Japan, Inc. will drop prices on its superminicomputer line by an undisclosed percentage, it was learned here. The price cuts are intended to double the sales of Prime machines in Japan, sources said.

■

TOKYO — Fujitsu Ltd.'s video conference system is operational now between its Tokyo headquarters and its five local offices. The facilities are said to be interconnected on a digital network system that can send and receive information over multimedia equipment through dedicated, high-speed circuits.

NETHERLANDS

AMSTERDAM — IBM Netherlands told its customers in a recent letter that it will withdraw its System/34 minicomputer from the market in February. IBM said that users who wish to change the terms of their rental agreements for their installed System/34s should do so. IBM will continue to support the installed systems.

IBM also announced price cuts on three licensed software packages: Systems Support Program, a utility program and a report program generator compiler.

TAIWAN

TAIPEI — Multitech Industrial Corp. of Taiwan has announced the DCS-570, a bilingual English-Chinese computer system. The fourth-generation machine features a hardware character generator for fast display of 17,000 different Chinese characters, the ability to emulate a variety of Chinese terminals, local-area networking capability, an operating system that allows Chinese-language multitasking and windowing and Chinese-language applications software capabilities.

The system is based on the Intel Corp. 8088 microprocessor and comes with 512K bytes of random-access memory, dual 640K-byte floppy disk drives, one RS-232C interface, one parallel Centronics Data Computer Corp. interface, a 121-key keyboard, six IBM Personal Computer-compatible expansion slots and a monitor.

The machine costs $6,250; a hard-disk version is $8,000, the vendor said.

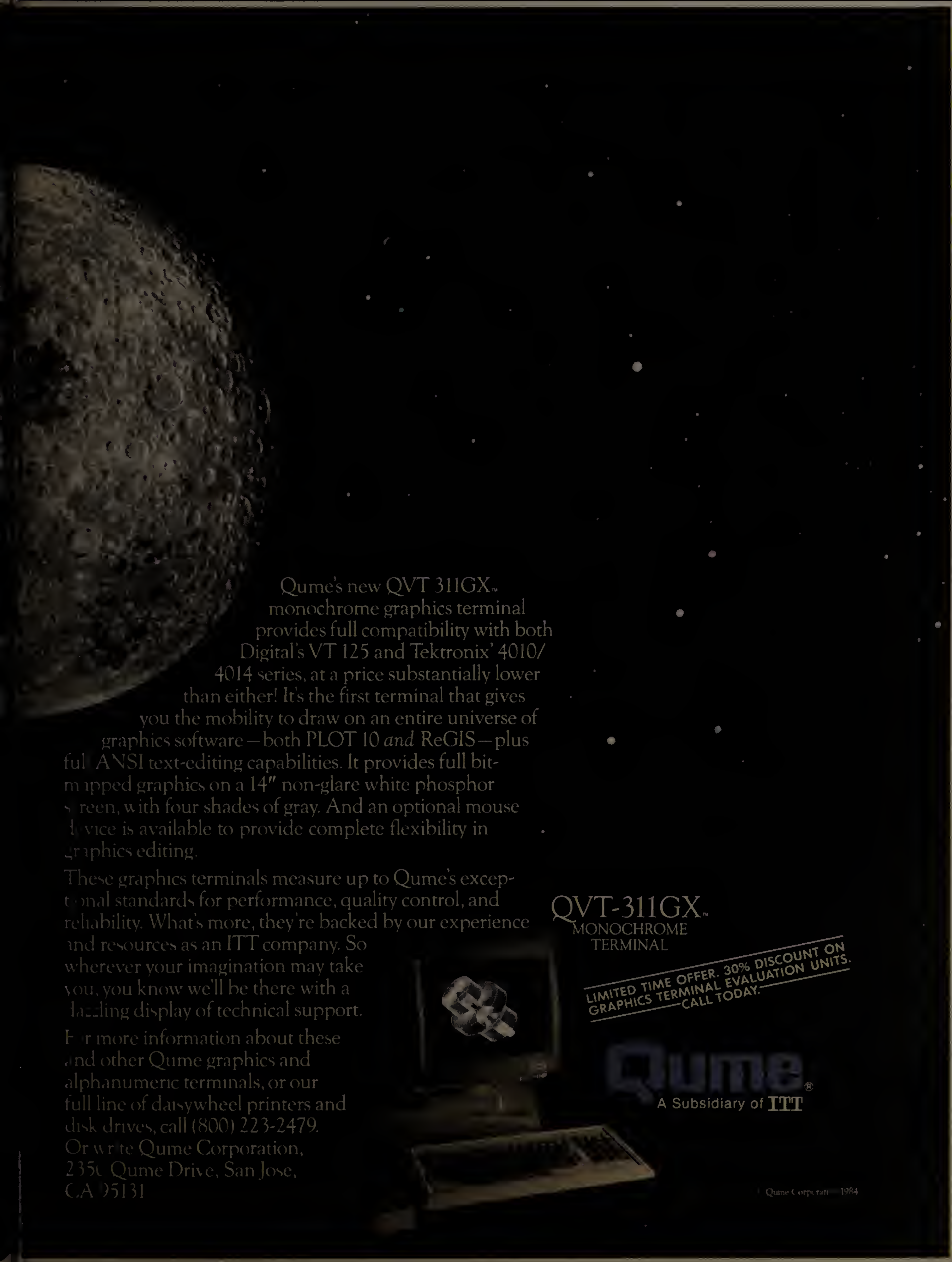
WEST GERMANY

MUNICH — Siemens AG has introduced Hicom, a digital private branch exchange for worldwide distribution. The system is said to handle simultaneous voice, text and images. It is based on the integrated services digital network standard of Europe's Consultative Committee on International Telegraph and Telephone (CCITT).

Bavarian Chief Minister Franz-Josef Strauss called the success of the Siemens project — three years ahead of schedule — an example of European information and communications capacity for innovation. Siemens funded the project, which consists of 1.2 million lines of code written in the CCITT high-level language, Chill. The great volume of code represents roughly half of the space used for operating systems on large mainframes.

The Hicom hardware is based on a specially designed telecommunications integrated circuit that integrates codes and filters onto one chip, featuring 30,000 transistor functions.

Up to 600 Hicom installations are expected to be delivered by year end, Siemens said. The workstation portion of the system, called Multiterminal 3510, will sell for approximately $1,550.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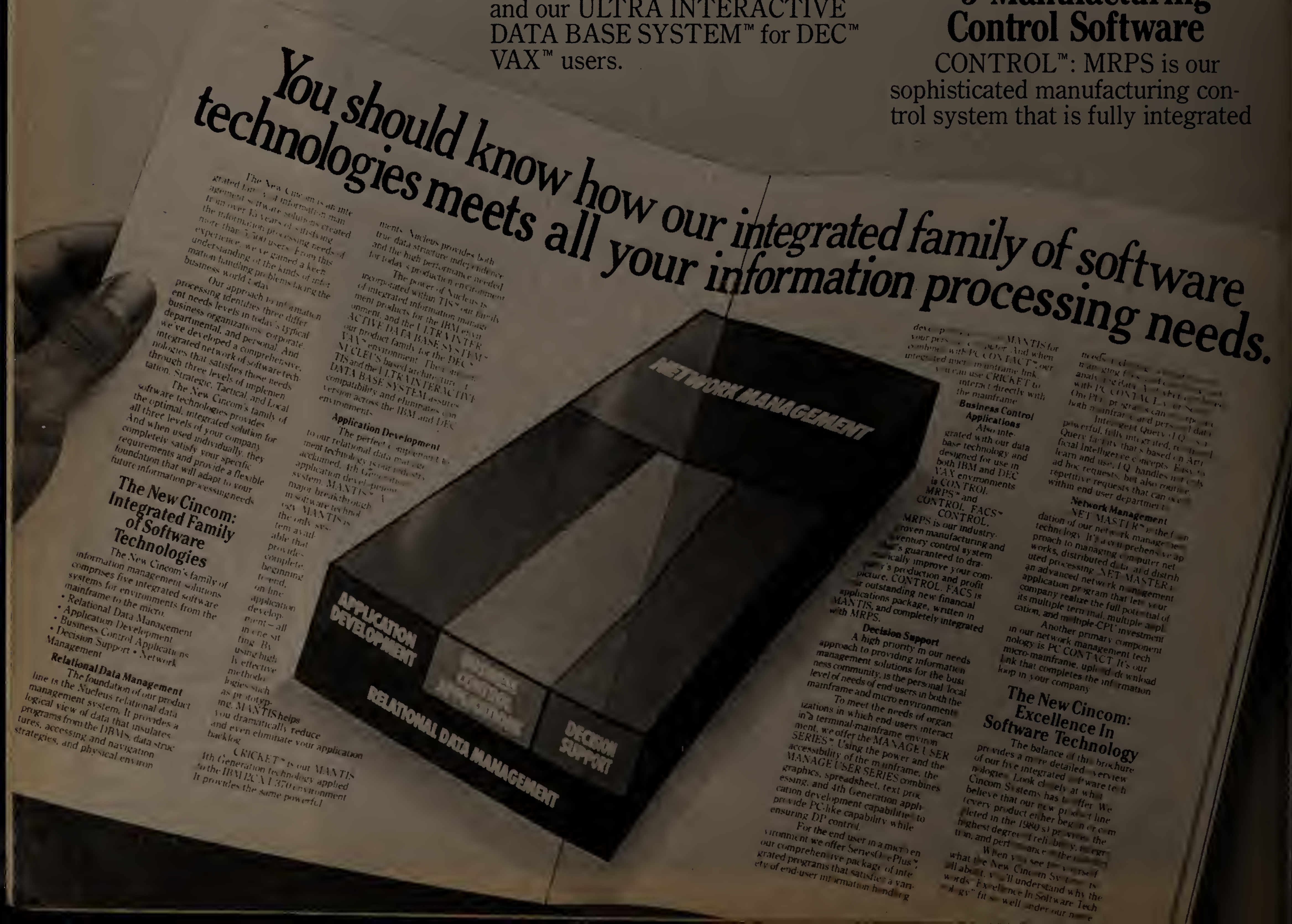
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Forestry firm's package tends to trees, manages money

PENROSE, New Zealand — Probably nowhere else in the world are natural resources more crucial to the national economy than in New Zealand, where more than 80% of the country's gross national product comes from fruits of the land and sea. At New Zealand Forest Products (NZFP), the country's largest manufacturing company, managing financial operations is as important as managing the nation's natural resources.

Lumber is a major export in New Zealand because forestry encompasses all land not suitable for farming, and forest products support other primary industries including farming and packaging. NZFP plants more than 18 million trees annually on 210,000 hectares of forest land to secure sufficient timber to meet future lumber needs.

To track its financial processing, NZFP used financial systems developed in-house in each of its four New Zealand major manufacturing sites in Kinleith, Whakatane, Mataura and here. After NZFP representatives visited McCormack & Dodge Corp. end-user sites in Australia in February 1982, NZFP became the first company in New Zealand to purchase M&D's general ledger information system, G/L Plus.

"We listened to presentations from Software International Corp. and Management Science America, Inc." said Roy Vannini, the firm's DP manager here. "It was important for us to purchase a global financial software package. And since M&D's system is user-defined, there are no massive data processing needs. It is a flat file for processing day to day," he explained.

Effective use of computer resources was also critical to NZFP because the firm depends on its computer for forest planning, Reid added. When land is cleared, the primary consideration is quick tree replacement to keep the growth cycle intact. Silviculturists — people who grow and tend trees — must model on a computer carefully so that each felled section of forest can be replaced immediately.

Ted Reid, NZFP's manager of special projects, noted, "We bought G/L Plus because of the pressure to improve our accounting system, which evolved from a hand-kept system to our in-house system. We also needed the ability to consolidate purchases and maintain a standard chart of accounts."

G/L Plus automated the firm's general ledger accounting and provided the needed information for financial analysis and planning, Reid said. Its data base structure made financial information readily accessible and allowed NZFP users to establish any level or variation of financial data required for reporting and analysis.

"We use the G/L Plus Statement Line File extensively for consolidations," he said. "We also use all three M&D report writers for the preparation of balance sheets, product cost statements and profit and loss statements." NZFP now processes 40,000 master file records amounting to 150,000 transactions per year. The company currently maintains 20 corporations with G/L Plus.

'[McCormack & Dodge Corp.'s G/L Plus] is user-defined; there are no massive [DP] needs.'

— Roy Vannini, New Zealand Forest Products.

Accounting at the major manufacturing sites was transferred from an NCR Corp. 399 system to an IBM environment. Each site now has access to a central data center containing an IBM 4341 with IMS/OS and an IBM 4381 running under TSO and MVS/OS.

For training, NZFP sent a project team led by Reid to Melbourne, Australia. After that, NZFP trained its staff internally. In June 1982, NZFP had G/L Plus up in its first location. "We completely changed the account coding structure to one uniform structure, and we had our first ledger up after a couple of months. . . . All of them were implemented by the end of the year," Reid said.

NZFP first brought up a batch system, and the first ledger was all batch. "We've installed [IBM's] IMS on-line [data base/data communications], and we've continued to provide parallel batch testing," Vannini said. "We run some batch programs now, but front-end users submit batch jobs through the on-line master file maintenance daily. We run our journals overnight, and they're ready first thing in the morning," Reid explained.

NZFP now runs both a production and a test system. In the production system, the facilities on the ledger are fully developed. In the test system, new company divisions are implemented, and new reports and techniques are tested.

The company has recently upgraded the G/L Plus system and is now considering M&D's Millennium:GL environment, a real-time, on-line version of general ledger.

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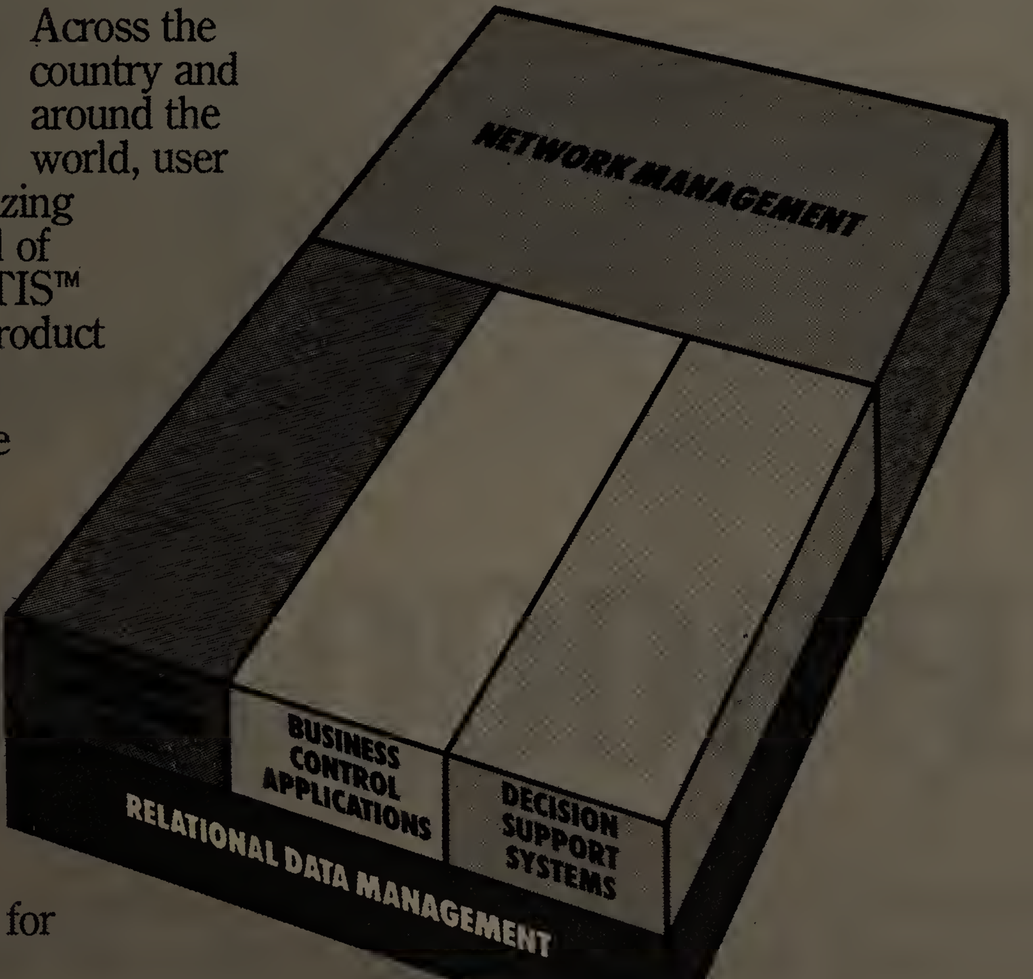

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New Haven, Connecticut	January 24, 1985
New York, New York	March 6, 1985
Oakbrook, Illinois	March 6, 1985
Orlando, Florida	February 7, 1985
Philadelphia, Pennsylvania	January 29, 1985
Philadelphia, Pennsylvania	February 26, 1985
Pittsburgh, Pennsylvania	February 7, 1985
Portland, Maine	January 22, 1985
Providence, Rhode Island	February 5, 1985
Raleigh, North Carolina	March 28, 1985
Richmond, Virginia	May 8, 1985
Rochester, New York	February 28, 1985
Salt Lake City, Utah	March 5, 1985
San Francisco, California	February 21, 1985
Schaumberg, Illinois	February 13, 1985
Seattle, Washington	February 26, 1985
St. Louis, Missouri	March 28, 1985
Stamford, Connecticut	February 13, 1985
Syracuse, New York	February 27, 1985
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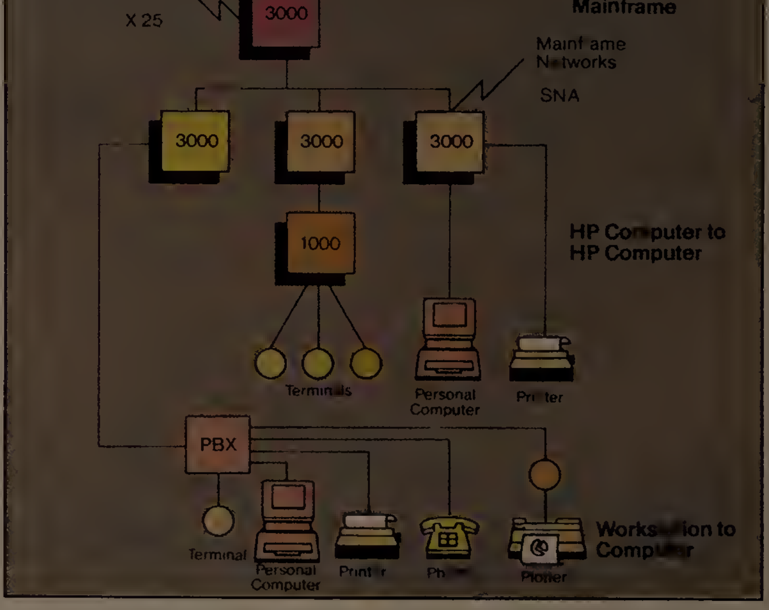
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Local-area network frees writers from manual labor

COLUMBIA, Md. — The annual task of developing 200,000 pages of technical manuals for weapons systems at Westinghouse Electric Corp. was a labor-intensive job involving handwriting and manual editing by 250 writers.

The company's Technical Data and Training Systems department here is responsible for producing 250 technical manuals each year supporting advanced weapons systems and other high-technology products, primarily for the U.S. Department of Defense.

Until last year, writers prepared handwritten manuscripts that were passed on to numerous other employees for typing, editing, illustrating and revising. The work took place concurrently with product development, a situation that meant product engineering changes often forced major revisions in the technical manuals, according to Bob Middleton, manager of technical data operations at the Westinghouse plant.

In late 1983, the department began installation of a Xerox Corp. Ethernet local-area network using 23 Xerox 8010 Star information systems, 10 Xerox 860 information processing systems and three Xerox 8040 laser printers.

"Our old system required that a number of skilled people handle the material. We think the 8010 workstations will reduce the need to involve so many people in so many preparation steps. The units enable us to incorporate engineering changes more easily than in the past. Regardless of the number of changes or when they occur, we are still required to come in on schedule," Middleton said.

He noted that the 8010s function as authoring stations, allowing writers to write and to make text changes on the system itself, rather than on paper.

Middleton said that in addition to eliminating errors and improving response to engineering changes, the network, which moves documents at a rate of 500 pages per minute, lets Westinghouse print out up to 50 copies of a manual on a laser printer. Larger press runs are handled by a government print shop using negatives produced by a Westinghouse reproduction facility.

The laser printers allow editors to specify vertical and horizontal columns, multiple columns, graphics, headings, footnotes, type styles and type sizes from their terminals.

Middleton said the network allows the authors to create line art, charts, block diagrams or graphs on the 8010 and merge them with text. He said the ability to control page design gives the writers more control over production.

"It was essential to us that the screen be able to display more than one page at a time and to display text and graphics simultaneously. This feature is important because the text of a manual often refers to a graph or drawing, and the writer must be able to view the illustration while drafting descriptive text," Middleton said.

Program runs in background

The 860 information processing system, running Westinghouse-developed software, allows editors and authors to check text for readability. That program runs in the background while the editor or writer is working and reports whether the length of words and sentences is too complex or too simple for the target reader.

According to Middleton, Westinghouse, which used stand-alone Xerox 850 and Xerox 820 personal computers and shared-logic Wang Laboratories, Inc. OIS 140 word processors before installing the network, plans to add more Xerox 8010s to the network in the future.

"The time and effort involved in technical data and training materials to support a major weapons system are [great]. We are counting on the automation provided by Xerox 8010 workstations to streamline our research and writing efforts and to improve product quality while satisfying our customers' long-range needs," Middleton said.

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EFDPMA hosts AI conference

TORRANCE, Calif. — The Education Foundation of the Data Processing Management Association (EFDPMA) and its local chapters are sponsoring a seminar on artificial intelligence that will examine AI and expert systems for data fusion. Topics will include system requirements, hardware/software options, development tools and advanced knowledge engineering methodologies.

The Intelligent Data Fusion (IDF) seminar will be held at the Colonial Hilton in Boston on Jan. 24 and 25, at the Sheraton Huntsville in Huntsville, Ala., on Jan. 28 and 29 and at the Marriott Twin Bridges in Washington, D.C. on Jan. 31 and Feb. 1.

The registration fee is $525 ($495 for individual members of EFDPMA). There are reduced rates for multiple registrations or for government or university personnel. More information is available from EFDPMA Seminars, c/o Technology Training Corp., Dept. IDF, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90505.

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TURNAROUND TIME

Larry Long

Q In a recent column, you defined "computer literacy" and raised a good point. Your definition was concise and usable as a beginning definition. But is computer literacy a fad or bandwagon upon which people hop without thinking?

The two most visible impacts upon society in this century have been made by the automobile and the computer. I have not, however, found any references to "auto literacy." I can make a few minor adjustments, such as pumping gas and changing tires, but when it really needs attention, I take it to an expert. I know a few buzz words, like "compression ratio," and I even have a vague idea of what they mean. This knowledge neither helps nor hinders me when I drive across town.

Computer literacy is relative. I'm a data processing manager and could professionally stand to be more computer literate, but I know enough to be able to punch the keys on an automatic teller machine.

My definition of computer literacy must have struck a nerve in the computer community. In my definition, computer literate people will be able to do the following:

- Be comfortable in the use and operation of a computer system.
- Be able to make the computer work for them through judicious generation or use of software.
- Be able to generate input from the computer and interpret output from it.
- Understand how computers are affecting society now and how they will affect it in the future.
- Be an intelligent consumer of computer-related products and services.

The analogy to auto literacy does not hold water. Those of us who drive automobiles take full advantage of their potential. When it is cold, we turn on the heater; at night, we turn on the lights; on the interstate, we drive the speed limit. A typical auto will have about 20 user-controled options.

Computing hardware and associated concepts are much more sophisticated. A computer user may have thousands of control options. Computer literate people do not have to understand synchronous communications protocols, but they should have a basic understanding of the devices and appropriate associated concepts, such as data management, systems vs. applications software and so on.

Perhaps the term computer literacy is a fad, but the concept is not. A person achieves computer literacy at a particular point in time. Part of becoming computer literate is learning that there is much more to learn.

Unless a computer literate person retains some exposure to the dynamic field of computers, that knowledge is quickly lost or becomes obsolete.

Over 90% of the population between the ages of 21 and 65 are auto literate, but less than 5% of that same group can drive a computer.

Q My marketing group, which consists of five product managers, myself and three administrative assistants, bought a micro about two years ago. It sat idle for more than six months, and finally, my manager asked me to learn how to use it.

I attended a two-day spreadsheet seminar and returned more confused then informed, but during the next month, I spent just about every waking hour in front of the computer or with a manual. A year and a half later, I am the company's micro "expert." The people in MIS refer all micro questions to me.

I'm still a product manager, but effective use of the computer has cut the time I used to spend on the job in half. Most of my time at work is devoted to assisting people in my group and in other groups with their particular micro needs or problems. I do nearly everything from education to setting up templates, but I don't enter someone else's data.

My unofficial microcomputer activities are actually encouraged by management, but I am evaluated strictly on my performance as a product manager. I find myself enjoying my work with computers much more than my job as a product manager. My current project involves networking the micros in my group.

I'm considering a career change to the computer field, but I don't know where to start. My present employer has been good to me, but I don't think I would enjoy working in our MIS department. My degrees are in business; do I need a computer-related degree? Is there a demand for someone like myself?

There is tremendous demand for people with expertise and home-grown computer talents. In not too many years, the majority of computer professionals will be organizationally attached to user groups, not to a central MIS department. To be sure,

See **TIME** page 40

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MANAGERS ON THE MOVE

PAUL A. STELLINE has been named program manager for financial information at GTE Lighting Products in Danvers, Mass.

He is responsible for data processing and information management for four business units within the company.

Stelline joined GTE Lighting Products in 1977 and has held a number of data processing posts there.

In 1980, he was named data processing project supervisor and a year later assumed his most recent position, data processing quality assurance supervisor.

Stelline

He holds an associate's degree from North Shore Community College, a bachelor's degree from Boston University and a master's degree from Rivier College, Nashua, N.H.

■

TIM LUKEN has been appointed vice-president of management and business and information systems for RCA Global Communications, Inc. (RCA Globcom). He will be responsible for RCA Globcom's internal management information systems and office automation.

For the last two years Luken has been director of information systems for the RCA Service Co., including Advanced Systems Development, Operations Research and the company's management information systems and data processing operations.

Before joining RCA in 1982, he held computer management positions with Weyerhaeuser Co. and Caltex Petroleum.

Luken

Luken received a Ph.D in mathematics from the Colorado School of Mines in 1973. He received a master of education in psychology in 1969 and a bachelor's degree in mathematics in 1967 from Xavier University.

■

FREDERICK H. HEMPHILL JR. has joined Lawyers Title Insurance Corp. in Richmond, Va., and has been appointed senior vice-president of management information systems of Continental Financial Services Co., also in Richmond.

Hemphill received his bachelor's degree from Yale University. He is a graduate of the Naval War College and received a master's degree in computer science from the U.S. Naval Postgraduate School.

Sytek meet set

PORTLAND, Ore. — The third annual meeting of the Sytek Network Users Group will take place February 19-21 here.

The sessions will reportedly cover aspects of Sytek, Inc.'s local-area network products, including Localnet/20 and IBM's PC Network, a product developed by Sytek.

More information is available from Greg Scott, Tektronix, Inc., P.O. Box MS 55-155, Beaverton, Ore. 97077.

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CONFERENCE ON SOFTWARE MAINTENANCE-1985
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Papers for this conference are being solicited on the topics of controlling software maintenance, case studies including both successes and failures, configuration management, debugging code, developing maintainable systems, software maintenance documentation, maintenance of embedded systems, software maintenance education, end-user software maintenance, software evolution, management of software maintenance, software maintenance metrics, software maintenance error distribution, software maintenance environments, maintenance of software packages, maintenance of hybrid systems, software maintenance practices, software maintenance careers, prototyping and software maintenance, maintenance of real-time systems, maintenance of distributed systems, software retirement/conversion, tools for software maintenance, technology transfer, testing software maintenance changes and understanding the software maintainer.

Five copies of papers and panel-session proposals should be sent to Roger Martin (CSM-85), National Bureau of Standards, Room B266, Building 225, Gaithersburg, Md. 20899.

Proposals for activities other than presentations of papers should be sent to Wilma M. Osborne, Caucus Chair, National Bureau of Standards, Room B266, Building 225, Gaithersburg, Md. 20899. The submission deadline for papers is Feb. 4. Acceptance notification will be April 26.

THE INTERNATIONAL TEST CONFERENCE 1985
Philadelphia, Oct. 1-3

Appropriate topics for paper submission may include, but are not limited to, the following areas: testability measures and fault analysis, computer-aided test generation and design validation, memory test, microprocessor and very large-scale integration test, wafer-scale integrated test, test equipment and methods, design for testability, analog and hybrid test, test software, surface-mounted component and assembly test, built-in self-test, test economics, quality and reliability, systems test, board test, process and test data management, test engineering management, artificial intelligence applications to test and future trends. Deadlines for submission are March 1 in Europe, Asia and India and March 15 in the U.S. and elsewhere.

The outline — defining the purpose of the work, the results obtained, conclusions and how the paper advances the technology — must be submitted in 10 copies to: A.B.M. Elliot, British Telecom Research Laboratory, Martiesham Heath, Ipswich, England IP5 7RE, in Europe; Tsuneta Sudo, Atsugi Elec. Comm. Lab., NT&T, 1839 Ono, Atsugi, Kanagawa 243-01, Japan, in Asia; Nripendra N. Biswas, Dept. of Elec. Comm. Engr., Indian Institute of Science, Bangalore 560-012, India; Rudy Garcia, International Test Conference 1985, P.O. Box 264, Mount Freedom, N.J. 07970, in the U.S. and elsewhere.

Additional information may be obtained from The International Test Conference 1985, P.O. Box 264, Mount Freedom, N.J. 07970.

INFORMATION SYSTEMS EDUCATION CONFERENCE (Isecon '85)
Houston, Oct. 26-27

Papers are now being solicited for the Information Systems Education Conference.

The deadline for submission of papers is Jan. 15. Contact: George Fowler, Program Chairman, College of Business, Texas A&M University, College Station, Texas 77843.

THIRD ANNUAL CONFERENCE OF THE AMERICAN VOICE INPUT/OUTPUT SOCIETY (Avios)
San Francisco, Sept. 10-12

Papers submitted should address one of the following applications: research or technology in categories such as telecommunications, office systems, manufacturing, materials handling, medicine, aid to the disabled, robotics, voice store and forward, education and consumer products.

The deadline for submission of abstracts is March 15.

Abstracts should be sent to Avios, P.O. Box 60940, Palo Alto, Calif. 94306.

TIME from page 38

there will be centralized control, but just about everything else will be distributed to the user areas, including people. The point is: You don't have to be affiliated with an MIS department to be a computer specialist.

Express your desire to pursue a more computer-oriented career to your manager. I would be surprised if your manager, or perhaps someone higher up, doesn't jump at such an opportunity. If they don't, there are a thousand marketing managers who will. The typical product manager in marketing still spends at least four hours every day laboriously seeking information that, with a little forethought and a micro, could be obtained in an hour.

If you wish to continue full-time with micros in a user area, an occasional continuing education course and plenty of reading will suffice. A degree in computer science will be of marginal value.

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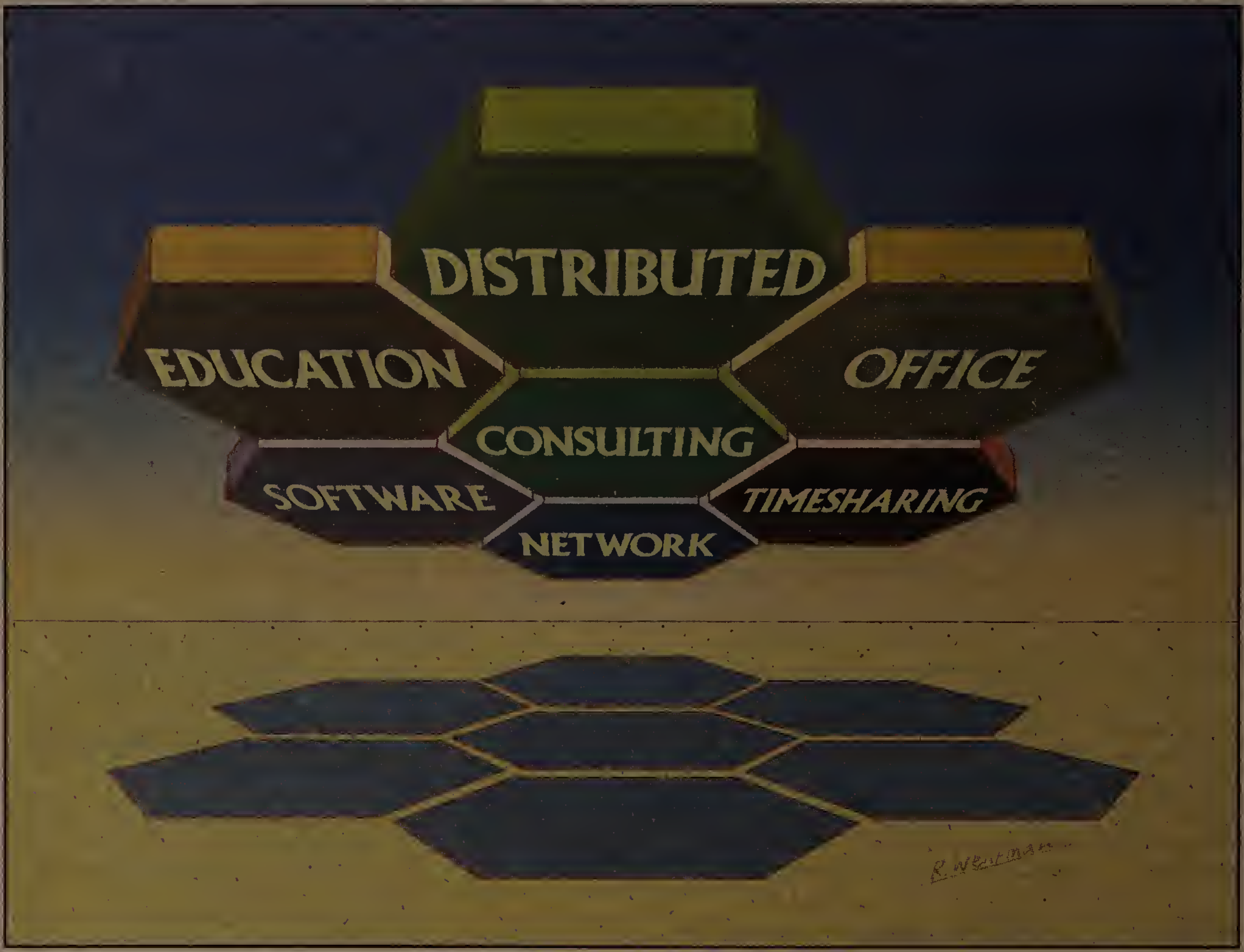

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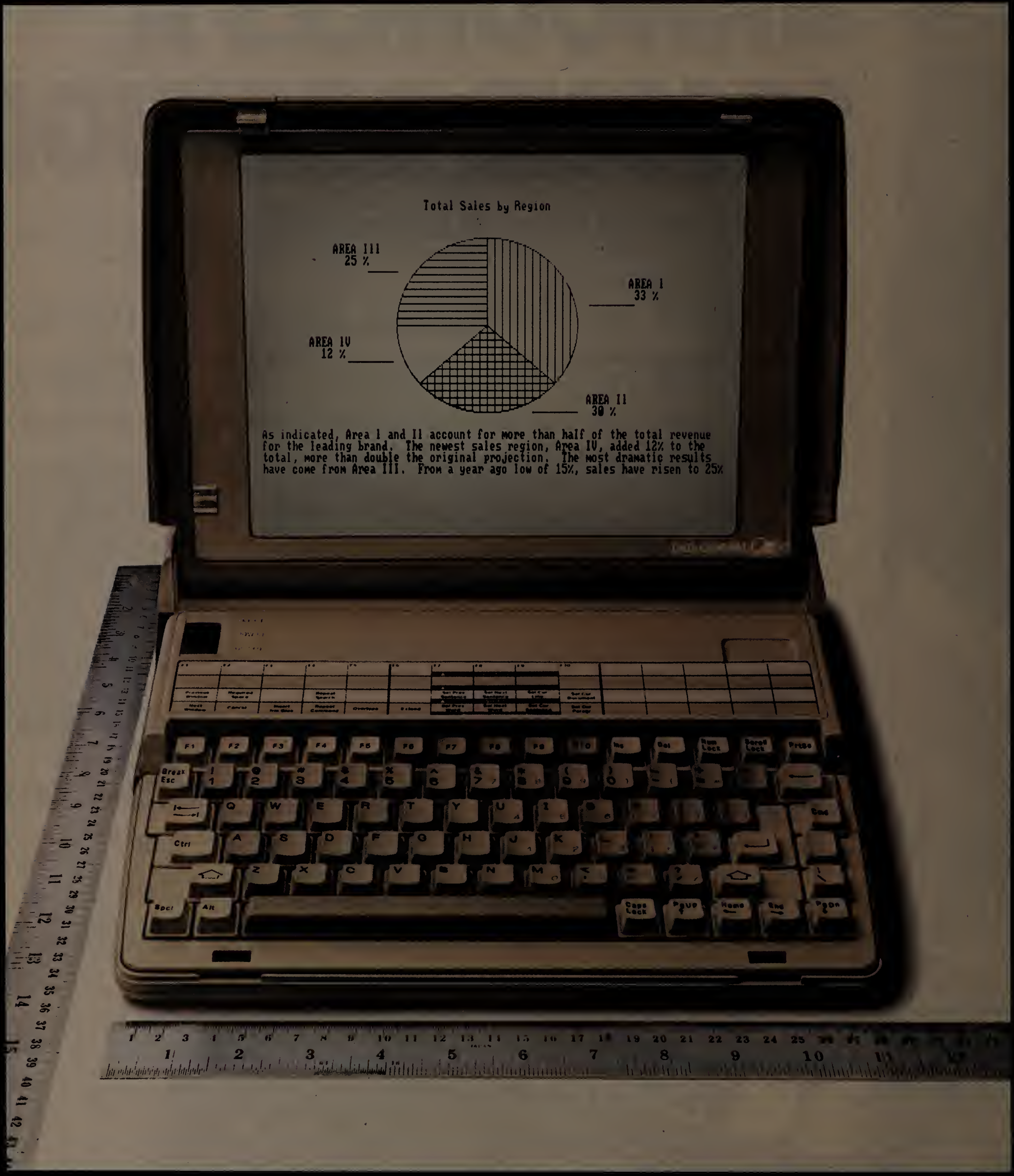

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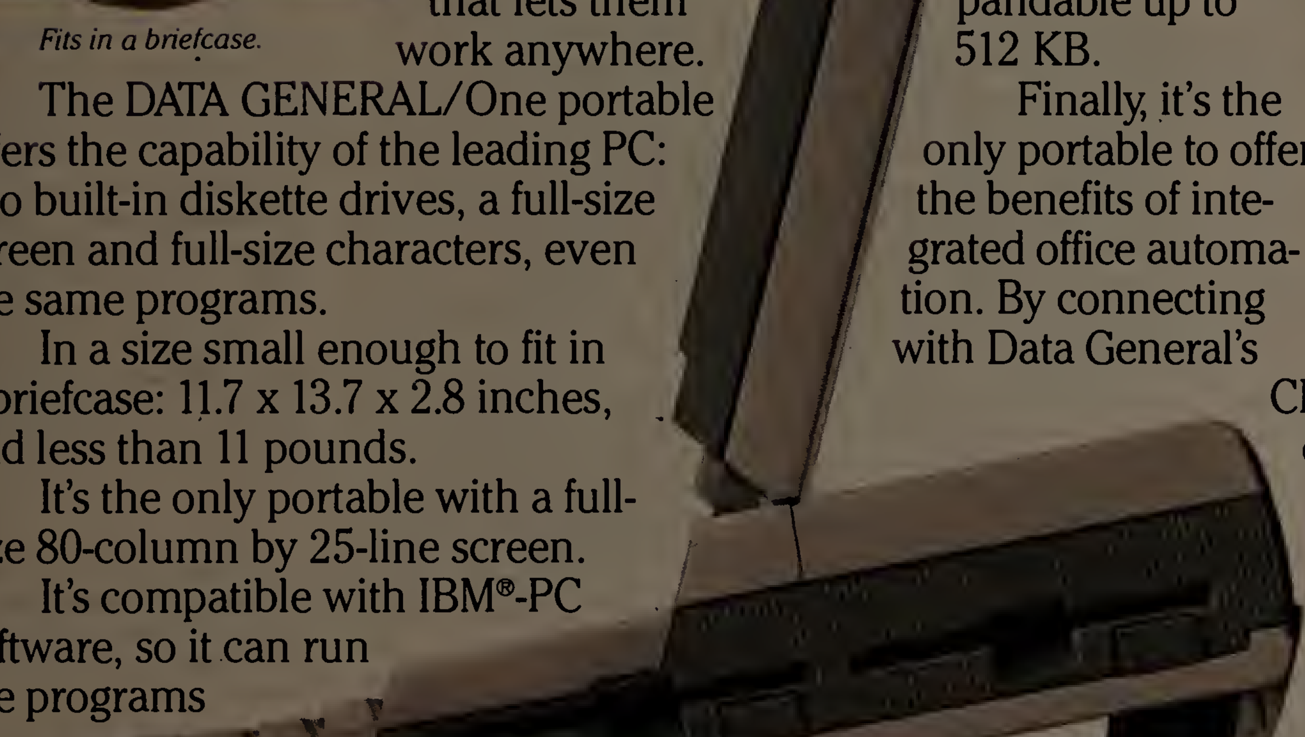

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CALENDAR

WEEK OF JAN. 20

JANUARY 21, BOSTON — **How to Document a Computer System.** Contact: Technical Communications Associates, Suite 210, 1250 Oakmead Pkwy., Sunnyvale, Calif. 94086. Also being held Jan. 23 in Hartford, Conn.

JANUARY 21-22, ORLANDO, FLA. — **Vsam OS & DOS Performance & Tuning.** Contact: Betty Bruce, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JANUARY 21-23, ATLANTA — **EDP Auditing & Controls.** Contact: Laurie Christie, Training Services, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JANUARY 21-23, ATLANTA — **Auditing Advanced Computer Systems.** Contact Laurie Christie, Training Services, MIS Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JANUARY 21-23, FORT LAUDERDALE, FLA. — **Office Information Systems Conference.** Contact: Lynn Bentley, Gartner Group, Inc., P.O. Box 10212, 72 Cummings Point Road, Stamford, Conn. 06904.

JANUARY 21-23, ATLANTA — **Auditors Role in Systems Development.** Contact: Laurie Christie, Training Services, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JANUARY 21-24, LOS ANGELES — **CICS Application Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JANUARY 21-25, DALLAS — **Uniforum: The International Conference of Unix Users.** Contact: Uniforum, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

JANUARY 21-25, HARTFORD, CONN. — **ANS Cobol Programming Workshop 1.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 21-25, RALEIGH, N.C. — **C Programming Workshop.** Contact: Suzanne Battista, Plum Hall, Inc., One Spruce Ave., Cardiff, N.J. 08232.

JANUARY 21-25, DENVER — **Computer Basics for Human Service Managers and Practitioners.** Contact: West Virginia University Research and Training Center, Suite E, One Dunbar Plaza, Dunbar, W.V. 25064.

JANUARY 21-29, HARTFORD, CONN. — **Assembler Language Coding Workshop.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St, Hartford, Conn. 06120.

JANUARY 22-23, SAN JOSE, CALIF. — **Technology and Market Forecasting in Electronics.** Contact: Futurecast Learning Center, 40 Birch St., Redwood City, Calif. 94062.

JANUARY 22-23, SAN DIEGO — **Maintenance Management for Productivity.** Contact: Institute of Industrial Engineers, Continuing Education Program Department, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JANUARY 22-24, SAN FRANCISCO — **Microspeak '85.** Contact: Stephen Schneiderman, Micro Communications, 500 Howard St., San Francisco, Calif. 94105.

JANUARY 22-25, LOS ANGELES — **Knowledge-Based Systems.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

JANUARY 23-25, ORLANDO, FLA. — **CICS/VS Internals for Systems Programmers.** Contact: Betty Bruce, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JANUARY 23-25, DALLAS — **Usenix Association Technical Conference and Tutorials.** Contact: Usenix Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

JANUARY 23-31, HARTFORD, CONN. — **PL/I Programming Workshop.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 24-25, FORT LAUDERDALE, FLA. — **Local-Area Communications Conference.** Contact: Lynn Bentley, Gartner Group, Inc., P.O. Box 10212, 72 Cummings Point Road, Stamford, Conn. 06904.

JANUARY 24-26, SAN DIEGO — **The 1985 Society for Computer Simulation Multiconference.** Contact: The Society for Computer Simulation, P.O. Box 2228, La Jolla, Calif. 92038.

JANUARY 25, DALLAS — **The Business of Data Communications Using FM Subcarriers.** Contact: Waters Information Services, Inc., Suite 322, Security Mutual Building, Binghamton, N.Y. 13901.

WEEK OF JAN. 27

JANUARY 28-29, WASHINGTON, D.C. — **Operating Systems: A Comparative Analysis.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

JANUARY 28-30, DALLAS — **Relational Data Base.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

JANUARY 28-30, NEW YORK — **Job Control Language.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JANUARY 28-FEBRUARY 1, DES MOINES, IOWA — **Basic Systems Analysis.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

JANUARY 31-FEBRUARY 1, NEW YORK — **Utilities/IDCAMS.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

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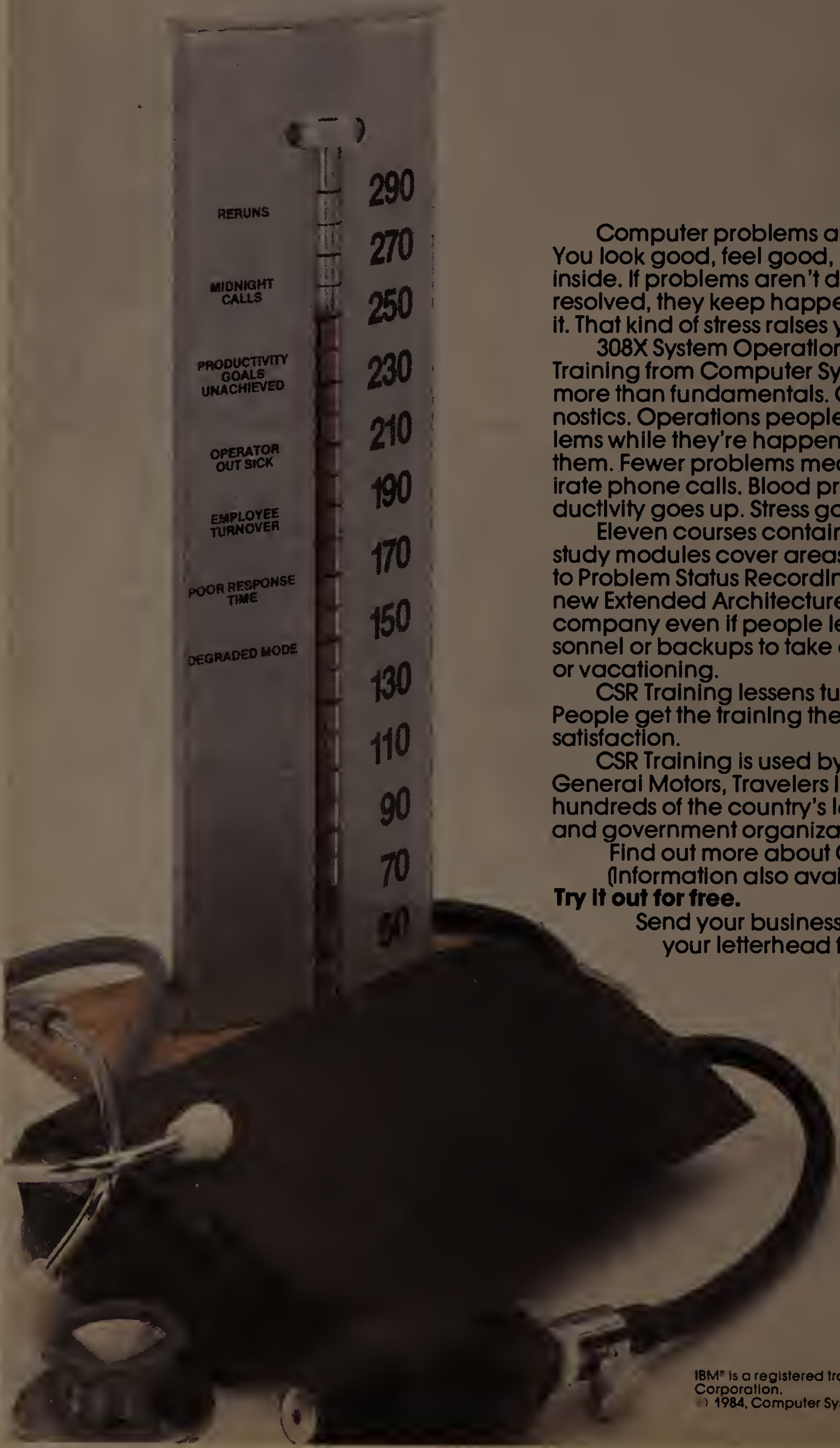

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EDITORIAL

Riding the wave of change

Those who survive and prosper in the computer business are the ones who anticipate the waves of change that characterize it, reacting before the waves hit and gaining ever greater advantage over competitors.

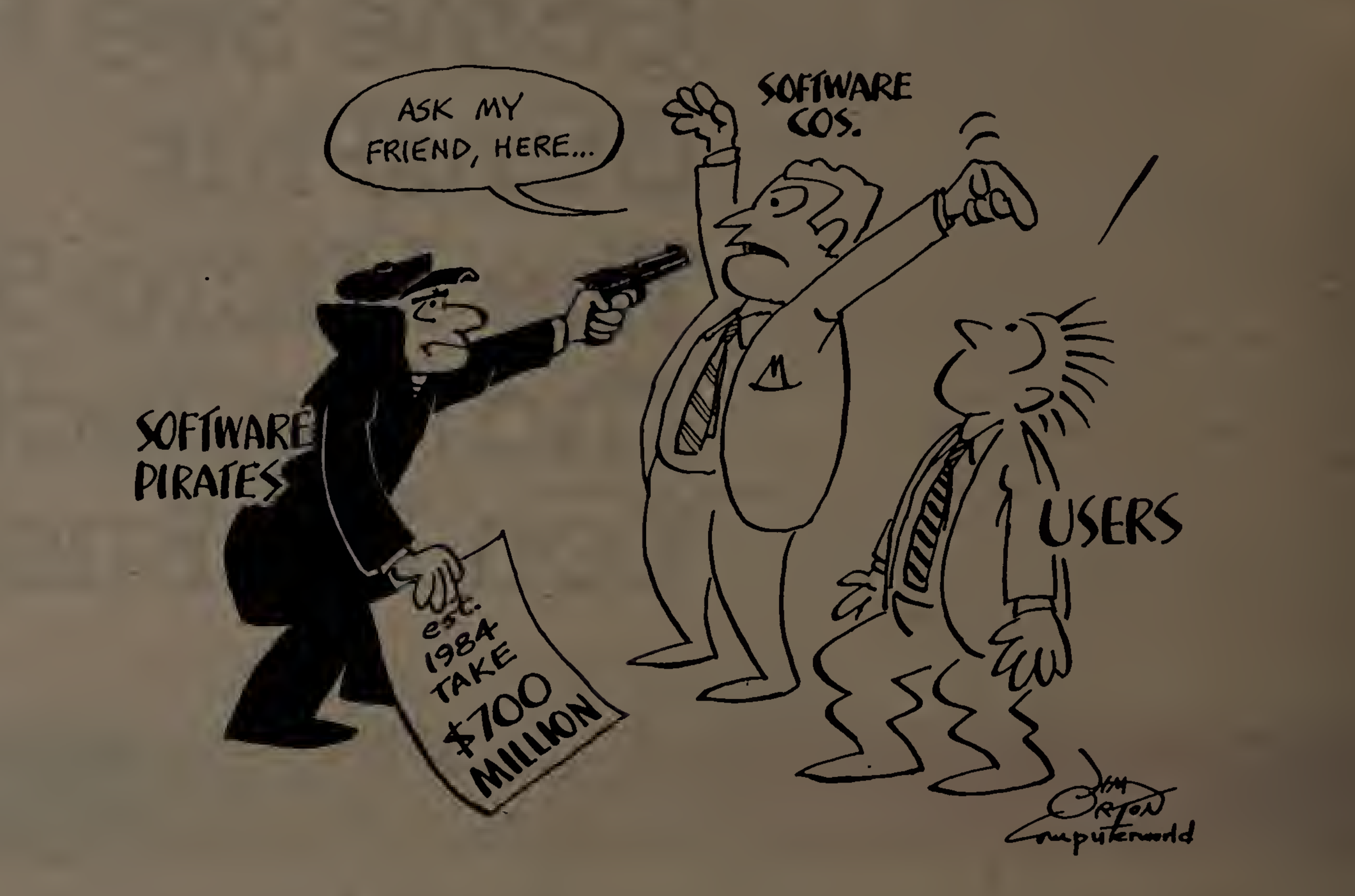
The same is true in the computer journalism business. Over the years, *Computerworld* has committed the resources needed to solidify its position as the No. 1 trade publication in the U.S. We have done this to anticipate change better and to interpret its impact on our readers.

Last year brought several changes to the computer business and, correspondingly, to *Computerworld*. We made key additions to our writing and editing staff, overhauled the design of the paper and added a technical section dedicated to microcomputers in the corporate environment.

This year promises no letup in the frenetic pace of change in the computer business, which again will be reflected in further expansions and additions to *Computerworld*'s coverage. Here's what we're planning:

- **Micro software benchmarks.** Starting in today's issue (page 11) and running once a month thereafter, our micro software benchmarks will attempt to assist managers in sorting through the plethora of vendor offerings before making a buying decision. The benchmarks are conducted by Yates Ventures, Inc. and feature an extensive graphical presentation as well as a detailed analysis of the tests conducted.
- ***Computerworld* Update.** Starting in April, we will present a monthly feature to keep you posted on key management and technology subjects. The purpose of the updates will be to offer the DP manager a critical look at managerial issues, such as recruiting and evaluating career paths, and an overview of emerging technologies, such as the fifth-generation push.
- **Expanded bureau coverage.** Recognizing that the Southeast represents one of the fastest growing areas of the country, *Computerworld* is opening an editorial office with one correspondent in Atlanta. In addition, we will add a second correspondent to our metropolitan New York office, which serves the most densely packed data processing community in the world.
- **Expanded graphics.** We have beefed up our design staff with the intention of providing more informational graphics to accompany our news stories and features. We recognize that our readers' time is precious and that a picture can be worth many words.
- **New columnists.** The op-ed page this year will feature new columnists in addition to those our readers have come to know. Today, for example, Walter F. Cuirle begins his fortnightly Management Matrix column.

We will continue to employ our tried-and-tested formula of printing news, not idle gossip and speculation, as we believe our readers have limited reading time and want their news right the first time. We are here to serve you, the DP manager, and always welcome your suggestions on how to do so better.



LETTER

User rises to defend IBM AT

The article "IBM AT falls short in Personal Computer compatibility" [CW, Dec. 17], was completely unfounded.

The statement regarding the screen update speed is simply not true. Your source may have been actually observing some other characteristic of the computer or program he was using. Also, the monitor limits the speed since IBM always waits for a new horizontal retrace signal before placing any characters into the screen buffer.

Regarding the statement "The AT can be upgraded from 512K bytes to its full 640K-byte random-access memory (RAM) capacity only by addition of a 128K-byte memory add-on board available only from IBM," this is another falsehood. I am using a Persist Time Spectrum multifunction board and it works just fine. I am running with 256K-byte RAM on my motherboard and 384K-byte RAM on my non-IBM multifunction board. This same multifunction board has been running in my Personal Computer since 1982.

The article states, "The AT is not compatible with the popular Iomega Corp. Bernoulli Box storage system for the Personal Computer." The problem here is simply that the software written by Iomega uses the speed of the Intel Corp. 8088 to determine drive integrity. I wrote software for the Iomega that does not rely on the speed of the computer. The Iomega hardware is completely compatible. It is certainly not IBM's fault if people write software that is dependent on machine speed.

Some users were described as dissatisfied with the AT's "inability to access full potential RAM." I

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VIEWPOINT

Enlist allies in campaign for bigger DP budget

THE DATA CENTER
John P. Murray

If you have made a commitment to build a higher level of information processing service for your organization, as you move toward that goal an entire set of new considerations relative to the function will arise. As the environment changes, the factors used to determine the establishment of the service level will also change.

As an example, consider the installation of an effective, successful data base management system (DBMS). After the considerable preliminary work has been accomplished and as a true DBMS environment begins to develop, a number of new opportunities for service to clients will begin to appear.

These opportunities will be found not only in the ability to produce information much more rapidly, but in the ability to manipulate and view that information in an expanding number of ways. An additional benefit will be the ability to do so without any involvement on the part of the information processing department.

As this environment evolves and clients begin to grasp the implications of these expanded capabilities, increased emphasis will be placed upon the continuing requirement for flexibility and responsiveness.

If the function is adequately supported and managed, what occurs is the development of an information utility. Those who desire information can obtain it with relative ease, speed and independence.

It is interesting, given a reasonable degree of success with the data base environment, how rapidly the clients will not only use the facility, but how rapidly they will demand expanded services and functions. This is particularly the case when a good fourth-generation programming language is made available to the clients and when its use is aggressively encouraged by information processing management.

Breach in information 'dam'

Once clients can begin to pose questions and obtain answers on their own, they begin to generate a number of questions they want answered through the facilities of the DBMS. As this develops, the appetites of at least some of the clients will quickly become almost insatiable. It is not an exaggeration to contend that the information "dam" will be breached.

As they gain confidence, the clients will begin to consider and want to try new methods to obtain, analyze and present this newly available information. The questions clients pose will begin to change from "would it be possible to . . . ?" to "why can't I . . . ?" A subtle change perhaps, yet it moves them from the realm of supplicant to practitioner.

In terms of value to the organization, the posing of such questions, coupled with the ability to answer many — perhaps most — without information processing department assistance, should be viewed as a very positive circumstance. However, such an environment does create a new set of concerns for information processing.

As the capabilities of the information utility begin to expand, sooner or later the issue of cost will become a factor. Providing this flexible, responsive environment does involve expense. Because the information processing department budget is often one of the larger expense items in most organizations, it is often the target of criticism.

The reasons for the increases in the budget are often overlooked by senior management. It is simply the case that as more becomes feasible, more is desired by the clients. The delivery of increased information has a cost; most of that cost will, unfortunately, find its way into the information processing department budget.

There is no question that the plethora of increased benefits to be found in the effective use of the new technology more than justifies the additional expense.

Link benefits, costs to improved management

The problem centers around the issue of helping senior management understand the value of that new technology. The goal is to link the increased benefits and costs to the improvement in the management of the entire enterprise.

The most effective means of communicating the value of the new environment is the development of an emperical perspective. The question of where the organization has been, as opposed to where it is now and where it can be taken, can, given a record of accomplishment, be used to build a strong case.

Those in other departments who have benefited from the success of the technology can greatly assist in the effort to convey its merits to management.The use of more advanced technology can drive the organization ahead. Those in areas outside information processing who are the recipients of these benefits should be solicited to help assure senior management of the value of the additional expense required to continue to increase flexibility and responsiveness.

This approach can also move much of the argument about such expenditures from the technical to the business area. The ability to discuss the benefits in the context of business, rather than technical functions, can be helpful. This is particularly the case when that argument is bolstered by members of departments other than information processing.

Despite such an apparently strong position for the continued support of increased funding to help the organization move ahead, a favorable response from senior management is by no means assured. There are situations where, for whatever reason, senior management simply will not provide adequate support for information processing. When that situation is encountered, those in the department who have made a commitment to the development of a quality function face a career decision.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Building on borrowed time

MANAGEMENT MATRIX
Walter F. Cuirle

Don't stop me if you've heard this one. The scene is a project planning meeting in a large corporation. Among the participants are the programming supervisor, let's call him Eric, and a representative of the end user of the proposed software product. The time line is laid out and the critical paths are identified. Since this is a new project, the schedule starts with the long, lonely word "specifications." And Eric's name is on it.

Eric shuffles his boots and says, "Look. That delivery date's pretty tight, and I'm not sure about it. We all have a pretty good idea of what this thing's supposed to do. Let's settle the specs verbally right here, skip the written folderol, and I can save us three weeks. The time my people would spend writing specs they could spend writing code."

The user just wants delivery on time. Nobody else there can really get started with his particular piece of the project until after Eric gets rolling. Everybody agrees to the idea.

I knew you might have heard this one before. Eric goes back to the director of MIS to report his little coup. The director, an otherwise sane individual, listens to Eric's arguments and, in a moment of weakness, agrees. Four months later the project is behind schedule and over budget.

Eliminating specifications is a seductive idea, in part because specifications are like a down payment on a project and leveraging a payment over time is a seductive idea. Ask any credit bureau. But it's not always a good idea. Look at any amortization schedule. Eliminating specifications is like borrowing time at heavy compound interest — always from the future of your own organization and that of the end user. On the other hand, there just might be occasions when you want to do it. What, in fact, is the interest on that borrowed time?

> *Eliminating specifications is like borrowing time at heavy compound interest — always from the future of your own organization and that of the end user.*

Let's start with the 80/20 rule of thumb. That's the old saw, "Eighty percent of the work gets done in 20% of the time allotted." The corollary is, "It takes 80% of the time spent on a job to do the last 20% of the work." You know the feeling, particularly near the end of a project, when practically the whole thing is in place, but it seems to take forever to get the last few loose ends tied up. Suppose the 80/20 rule is true. If so, then productivity is 16 times higher in the early phases of a project than it is near the end.

It's not important how you measure productivity — lines per hour, function points per hour, pages per day, gallons of coffee per week — it's still a factor of 16. Here's why.

Drop in productivity

Take a look at a finished project as a baseline, let's say 100 points worth of code that took 2,000 hours from first meeting to final sign-off. If the 80/20 rule is true, then 80 points were done in the first 400 hours and the remaining 20 points took 1,600 hours. This means that productivity early in the project was one point per five hours, dropping off to one point per 80 hours near the end. The ratio of early to late productivity is 16.

So far, this looks like a good argument for not doing specifications. Maybe Eric's right. With productivity that high, you could get a lot of code done early in the project, and you should have a working system fairly early.

The catch is that, without specifi-

See **PROJECT** page 48

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

LETTERS

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would hardly expect that the inability to reference more memory than you can put on a Personal Computer or Personal Computer XT would be an incompatibility. An incompatibility is not being able to do at least the same thing.

"Only about 35% of the Personal Computer's software base has been certified as usable on the new machine." Who exactly is the certifying agency? I don't think there is one.

Here is the real story. A quick look at the read-only memory (ROM) listings will show that IBM has gone to a great deal of trouble to give compatibility to even those programmers that were told not to rely on the locations of tables, pointers and entry points in the ROM.

I've dug into schematics, tested direct memory access and interrupt controller programming, checked out keyboard interrupt processing, compared the Intel 8087 and 80287 differences and tested all of our own code; the AT is as compatible as you can get and still have a reasonable upgrade.

Programmers have been informed through Intel publications and magazine articles that there are some differences in the 8088 and the 80286. Those few differences are so minute that the number of programs that would be affected is almost nil. If there appear to be incompatibilities, they are probably due to poor programming practices.

Anyone advertising an Intel 80286-based computer that is more compatible than the AT has probably picked an isolated case and used Personal Computer technology — such as using 360K-byte disk drives — to regain "compatibility."

Edward S. Quicksall
San Antonio, Texas

Modem fits to AT

The article "IBM AT falls short in Personal Computer compatibility" [CW, Dec. 17] states: "Compatibility problems have also arisen when some users tried to insert communications add-on boards for the Personal Computer into one of the eight expansion slots of the Personal Computer AT. Roy Hill, chief programmer in the technical support section of Michigan Blue Cross/Blue Shield, said he found the Hayes Microcomputer Products, Inc. Smartmodem board would not work in any of his firm's four ATs."

I do not know what specific problems Hill encountered, but I know that the Hayes modem can be installed in an AT. I own and use an enhanced IBM Personal Computer AT. When I purchased it, I installed the Hayes 1200B internal modem taken from my previous IBM Personal Computer. The Hayes works like a charm, and I use it extensively for telecommunicating and autodialing.

The AT has eight expansion slots. Two of these use the identical connector that was used in the IBM Personal Computer. The remaining six slots use the new 16-bit connector. Usually the fixed/floppy disk controller is inserted in one of the 16-bit slots, leaving five slots for other uses. A display adapter takes up one of the two 8-bit slots, leaving one remaining.

The Hayes modem will fit snugly into that one and will work without a hitch. The modem must be installed in the remaining 8-bit slot. Mr. Hill is correct in that it will not fit in any of the five 16-bit slots.

Dr. C. Scot Giles
Oak Park, Ill.

Sample DP crime bills

In reference to the article "DP groups begin computer crime law efforts" [CW, Dec. 3], I think the following may be helpful.

In 1979 the National Association for State Information Systems issued guidelines for drafting computer crime legislation which contained a sample bill. This bill and another were published in the 1981 edition of "Suggested State Legislation."

The just-released 1985 edition of "Suggested State Legislation" contains two updated drafts of such bills, one of which contains provisions addressing minors and hackers. The use of these publications may save a lot of research time.

They can be obtained at a cost of $12.00 and $15.00, respectively, from the Council of State Governments, P.O. Box 11910, Lexington, Ky. 40578.

Carl Vorlander
Lexington, Ky.

PROJECT

from page 47

cations, that system isn't likely to be deliverable. You are going to have to make a lot more changes to the system than you normally would, and you'll be making those changes late in the project. So, a feature that might have taken two hours to implement if it had been properly specified up front will take 32 hours later on.

Oh, it probably won't take a full 32 hours of programmer time. It will almost certainly be more than two, but the remainder comes out of other departments. For example — near the end of the cycle, your user documentation is in progress and probably near completion. Now it has to be changed. Maybe a conversion is in progress and needs to be modified, halted or backed up. That takes time — not to mention the time now taken up by an increased number of phone calls from increasingly frosty colleagues.

So there you have it. It will cost you 1,600% interest on the borrowed time if you try to get a product up and running without specifications — which goes to prove another old saying: "If there is time to do it over, there was time to do it right."

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SOFTWARE & SERVICES

Information engineering evolving into a science

SOFTLINE
William H. Inmon

As data processing has evolved, approaches to engineering increasingly complex information systems have become more streamlined and globally oriented.

In this first of a two-part Softline, Inmon looks at the new information engineering environment.

Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.

Information engineering — the discipline of computerizing systems on a platform of stability and manageability — has its origin in the structured movement. The structured approach proclaimed that coding and design practices could lead to systems that could be constructed quicker and maintained more easily. Information engineering has progressed to where the promise of system stability is beginning to be realized.

To date, the focus of information engineering has shifted several times, much like a swinging pendulum. In the early days, structured

See **INMON** page 58

THREE LEVELS OF DATA MODELING

The Global Level

- Entity relationship diagrams
- Devoid of detail
- Completeness of model
- Relationship of major components
- Commonality recognized and combined

The Middle Level

- Minimum structure models
- Some detail
- Reflection of global relationships
- Expands on data, processes identified at global level

The Detailed Level

- Structure models, physical models
- Expansion of data, processes identified at the middle level
- Low level of detail

Figure 1

■ The U.S. Department of Defense has validated Verdix Corp.'s Ada compiler for Digital Equipment Corp. VAX processors running Unix/**50**

■ I. P. Sharp Associates Ltd. has released a data management system for IBM mainframe-based information centers/**50**

INSIDE

Systems Software/**50**

PC Info micro-mini link out from Henco

WALTHAM, Mass. — Henco Software, Inc. has introduced a micro version of its Info fourth-generation language information management system that allows micro users to tap into Info files and applications on a mini.

PC Info is compatible with the company's mini versions of Info. It features the same functions, screen and report generators, command sets, relational capabilities and interfaces to standard data files as Info. PC Info also provides an upload/download function that allows users to access existing Info applications, reports and files on both the mini and micro.

PC Info also offers a conversational language that allows users to create and maintain data and lets users perform DP functions without conventional programming techniques.

PC Info is available for the IBM Personal Computer-XT and Personal Computer AT. PC Info requires a micro with 512K bytes of memory, IBM's PC-DOS 2.1, a 10M-byte hard disk drive and a 5¼-in. diskette drive. It is priced at $1,200.

Henco Software is located at 100 Fifth Ave., Waltham, Mass. 02154.

SOFTALK/PAUL GILLIN

Firm's inaugural, exec-friendly tool worth a look

This column is rarely used to discuss new products, but there is one product debuting late this month that merits a look from DP managers who are trying to get their executives to use computers.

Command Center is the first product of Pilot Executive Software, Inc., a Boston-based firm founded by David Friend. Friend was the force behind Computer Pictures Corp., which developed the Trend-Spotter executive workstation, and ARP Instruments, Inc., a well-known name in musical synthesizers.

At first glance, Command Center looks a lot like Trend-Spotter. But Pilot's premier product has some interesting and unique twists. Command Center uses an IBM Personal Computer connected to an IBM VM-based mainframe or Digital Equipment Corp. VAX computer. Extracted data is maintained on the mainframe and only downloaded on the microcomputer in very limited doses. Thus, the user can perform some fairly sophisticated manipulations utilizing large-system power and uses the micro only for things like full screen editing, local storage and graphics.

Command Center has a data import facility that allows data to be extracted from any number of external and internal data bases and file structures and loaded into a dedicated data base, according to Pilot. It then has an assortment of embedded routines that can be used for statistical and graphics analysis. In front of all this is a mouse-driven interface and a customi-

See **PILOT** page 54

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MVS/XA
MVS

I.P. Sharp unveils info center data management system

TORONTO — I.P. Sharp Associates Ltd. has announced a large-scale data management system for information centers based on IBM mainframes under IBM's MVS, MVS/XA and DOS/VSE operating systems.

Called Viewpoint, the product provides maintenance, retrieval and data analysis capabilities as well as an electronic mail facility. The electronic mail features make it possible to send reports around the world using I.P. Sharp's Ipsanet international communications network. The IBM Systems Network Architecture and asynchronous networks are also supported. Viewpoint includes a report writer, integrated graphics, multilanguage capability and secure shared data access around the world, a spokesman said.

Management tools include accounting and chargeback statistics and data and user administration tools. An online Help facility is included.

A Viewpoint installation provides a controlled hardware environment with crash recovery, system performance tracking and reporting tools and real-time resource monitoring to the end-user level, the spokesman said. The company provides installation assistance and 24-hour support.

A Viewpoint workstation enables IBM Personal Computer users to access the product in the same way as users with full screen display stations but over an asynchronous network.

A long-term license fee costs $37,500 plus 15% per year for services and enhancements. The monthly license fee is $1,500 including service and enhancements.

I.P. Sharp is located at Suite 1900, 2 First Canadian Place, Toronto, Ont., Canada M5X 1E3.

DOD backs Ada compiler from Verdix

MCLEAN, Va. — Verdix Corp. has announced Department of Defense (DOD) validation of the company's first Ada language compiler.

According to a spokesman, DOD validation of the Verdix Ada compiler was completed in mid-December. The compiler is the base of the company's Verdix Ada Development System (Vads), which is scheduled for delivery in January. Vads is said to be a production-quality system that supports large-scale Ada software development. Vads utilizes the AT&T Unix operating system and is implemented on Digital Equipment Corp. VAX-11 processors. Vads includes runtime support and library management and symbolic debugger utilities designed to facilitate programmer productivity.

The complete Vads system, including the validated compiler, is priced between $7,500 and $30,000 depending on the host machine.

Verdix is located at Westgate Research Park, 7655 Old Springhouse Road, McLean, Va. 22102.

SYSTEMS SOFTWARE

MACRO 4, INC.
Vpac Performance Accounting and Control

Macro 4, Inc. has announced the Vpac Performance Accounting and Control system for IBM mainframes running under IBM's VM operating system.

According to a spokesman, Vpac runs as a virtual machine to monitor events occurring in other virtual machines and in VM's Control Program. The data the system gathers is written to a file on a normal IBM CMS minidisk.

Other Vpac facilities include a real-time monitor and exception condition reporting, resource control and

Continued on page 51

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SOFTWARE & SERVICES

Continued from page 50

long-term planning capabilities.

Vpac is said to display current and historic usage of key resources. Its monitoring capabilities allow the user to detect overcommitment of resources before users are affected.

Vpac is available for an introductory lease price of $195/mo until March 1.

Macro 4, P.O. Box 187, Millbrook Plaza, Mt. Freedom, N.J. 07970.

UNIPRESS SOFTWARE, INC.

Amsterdam Compiler Kit for AT&T Unix

Unipress Software, Inc. has introduced a package of C and Pascal compilers and assemblers for the Unix operating system.

The Amsterdam Compiler Kit reportedly compiles C and Pascal language programs and produces code designed for Unix-based processors using Motorola, Inc.'s 68000 and Intel Corp.'s 8086 microprocessors and Digital Equipment Corp.'s VAX-11 and PDP-11 minicomputers.

The kit consists of a preprocessor, a front end, a peephole optimizer, a global optimizer, a back end, a target machine optimizer, a universal assembler and a utilities package. Complete source code is included. The kit costs $9,950.

Unipress Software, Suite 312, 2025 Lincoln Hwy., Edison, N.J. 08817.

JCA SOFTWARE, INC.

SAR Version 3.0

JCA Software, Inc. has introduced a version of the Sysout Archival and Retrieval System (SAR) designed for use with IBM's MVS and MVS/XA operating systems. The SAR package was developed by Essential Software, Inc. and is marketed by JCA Software.

The SAR package reportedly enables an MVS installation to archive and retrieve system output — IBM's Sysout — on-line and to print only the information that is needed. SAR can interface with Essential Software's Express Delivery Report Distribution and Tracking System.

SAR is said to archive job control language (JCL) listings, systems log data and reports to disk and tape. It also scans JCL listings for exceptional conditions.

The price of SAR Version 3.0 is $15,000 for a site license.

JCA Software, Suite 224, 2182 Dupont Drive, Irvine, Calif. 92715.

APPLIED DATA RESEARCH, INC.

Enhancements to Roscoe and Empire

Applied Data Research, Inc. (ADR) has announced that its ADR/Roscoe and ADR/Empire products will support IBM's 3270 Personal Computer, the 3295 Plasma Monitor and the 3290 workstations.

According to a company spokesman, the 3295 workstation includes a gas panel display, provides all 3270-PC base Control Program functions and allows a single full screen display presentation of up to 62 rows by 160 columns. Users of Release 5.4 of Roscoe, ADR's on-line program development system, and Release 3.3 of the Empire decision support system will be able to have up to four concurrent host sessions.

The vendor said Roscoe will support the 3290 in large-screen native mode. Empire supports text and graphics display on all 3270-PC devices supported by IBM's Graphic Data Display Manager.

Release 5.4 of Roscoe and Release 3.3 of Empire will be available during the first quarter of this year. The permanent license price for Roscoe, which operates under IBM's MVS, is $57,500. The permanent license for Empire, which operates under Roscoe, MVS and VM/CMS, is $45,000.

ADR, Rt. 206 & Orchard Road, CN-8, Princeton, N.J. 08540.

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SOFTWARE & SERVICES

AIDS from page 51

M. BRYCE & ASSOCIATES, INC.
IDD and Pride-ASDM Interface

M. Bryce & Associates, Inc. has introduced an interface between Cullinet Software, Inc.'s Integrated Data Dictionary (IDD) and the company's own automated systems design methodology, Pride-ASDM.

Reportedly, Pride-ASDM currently operates on more than 20 different computers, including IBM 370, 4300 and 30 series mainframes and Digital Equipment Corp., Honeywell, Inc. and Sperry Corp. computers. The IDD interface converts the Pride-ASDM information resource management component descriptions and specifications into IDD entity definition transactions for input to the IDD.

The IDD interface is priced at $7,000.

M. Bryce & Associates, 1248 Springfield Pike, Cincinatti, Ohio 45215.

BLOSSOM COMPUTING CO.
Soft Recovery Management System

Blossom Computing Co. has announced a utility designed to aid in file recovery of Wang Laboratories, Inc. VS series computer systems that have crashed.

According to a spokesman, the Soft Recovery Management System displays at the workstation all names of disk volumes that are mounted on the VS system. The operator then selects the volumes to be scanned for open files, the software extracts a list of all files on the selected volumes and, for each one of the indexed and alternately indexed files, determines if the file was left open in the I/O or shared mode.

The spokesman said the utility then reports these file names interactively to the operator at the workstation and generates a hard-copy report showing the open files sorted by volume name. The utility then proceeds with the reorganization process. It can display up to 10 such open file names and enables the operator to make a selection of the files that have to be reorganized.

The utility is priced at $495.

Blossom Computing, RFD No. 1, Box 501C, Hubbard Pond Road, New Ipswich, N.H. 03071.

FEL COMPUTING
Mobius

FEL Computing has introduced a software system said to integrate Digital Equipment Corp.'s VAX series, Decsystem-10 and Decsystem-20 host machines with microcomputers using Digital Research, Inc.'s CP/M and Microsoft Corp.'s MS-DOS operating systems.

According to a spokesman, FEL Computing's Mobius allows the micro user to access host data and peripheral devices as if they were resident on the micro. Mobius includes an Instant Terminal Emulation feature that can suspend the program and freeze its context and data. When the user returns from the terminal emulation mode, the applications program will resume operation where it left off, the company said.

Mobius reportedly communicates through the asynchronous communications ports of the micro and a direct cabling link, a standard modem or a network. The product includes security features and an error-checking and correction protocol, the spokesman said.

Price of the product is based on the number of simultaneous users. Minimum price for five users on the host version is $3,500. Users pay $250 per micro version, and license fees decrease depending on the number of users.

FEL Computing, P.O. Box 200, East Dover, Vt. 05341.

ALCYON CORP.
C68

Alcyon Corp. has announced that its C68 compiler now runs on Hewlett-Packard Co.'s HP 9000 series of microcomputers under HP's Hpux operating system.

According to a spokesman, C68 is a full implementation of both the

Continued on page 54

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New Technology Update

The impact of Virtual Networking Systems on data communications

There's a new product class emerging in response to an old problem.

Virtual Networking Systems are being designed to link desktop personal computers into integrated clusters. Clusters that share information, peripherals and other resources on a local and remote basis. And with corporate mainframe host computers.

Right now you're probably saying to yourself, "Hey, wait a minute. What about Local Area Networks; Disk, Print, and File Servers; Protocol Converters; and Mainframe Upgrades?"

Unfortunately, these products and others like them are single point solutions that address only a small part of the problem. None of these choices supply a complete communications solution.

What's worse is that they require users to learn new commands and new procedures. And they don't easily accommodate new devices, new applications or network expansion. Some of these partial solutions even limit the choice of workstations in the network to a specific vendor. And these "solutions" can be very expensive.

There has been a desperate need for integrated architectures. Systems that will provide a uniform and consistent approach to computer communications. There has been a very real need for *Virtual Networking Systems.*

Virtual Networking Systems: a definition

Virtual Networking Systems include both hardware and software. They provide a means of creating a distributed system that incorporates the multi-user functionality of a mainframe host and the ease of use of personal computers.

Virtual Networking Systems are flexible. Flexible enough to link a variety of personal computers, minicomputers and mainframes using a mixture of LANs, protocols, gateways and public networks. A *Virtual Networking System* will also support shared resources such as printers, disks and files.

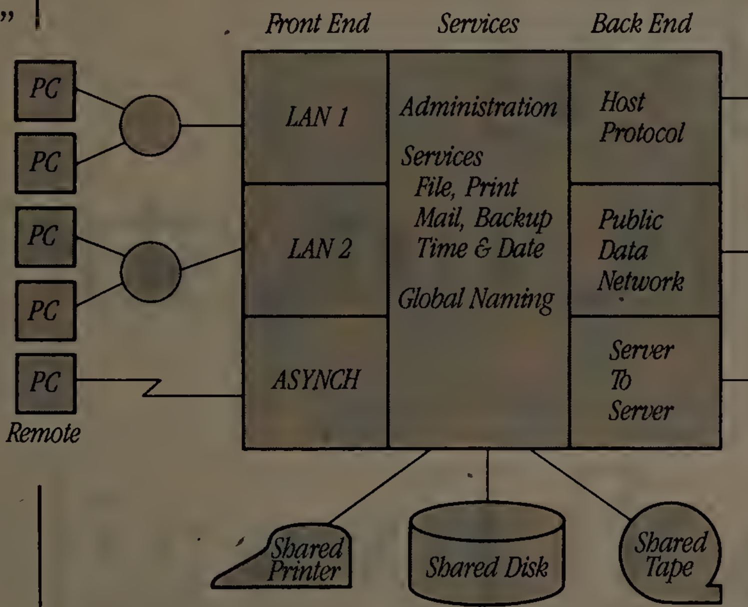
With a *Virtual Networking System* accessing information can be completely transparent. The information might be on a personal computer, in another cluster, or on a mainframe. It makes no difference. Access to information is as easy as reading a file on a personal computer.

A Virtual Networking System makes it easy to . . .

- **Find Information**–When there is a large number of users, PCs and a lot of information scattered throughout a work group, division or several corporate locations, it's critical to have a global naming capability. *Virtual Networking Systems* do.
- **Move Information**–*Virtual Networking Systems* provide a powerful and complete set of communications protocols that move only the data you actually need, whether it is a byte, record or complete file.
- **Use Information**–*Virtual Networking Systems* make it possible for computers to share information–whether they are alike or not.
- **Share Information**–*Virtual Networking Systems* hardware and software supply the necessary technology to efficiently and economically share information among personal computers, mainframe hosts and workstations.
- **Control Information**–Multi-level administration and security capabilities are two other characteristics of *Virtual Networking Systems.*

An integrated data communications strategy

Now, for the first time, an integrated communications strategy is possible. By utilizing the unique features of a *Virtual Networking System,* a comprehensive information management system can be designed to enhance individual performance and increase corporate productivity.



Virtual networking system schematic

*The ideal Virtual Networking System has three key functional elements . . . **#1. The Front End**–supports a range of personal computers connecting them with a variety of LANs, multiple LANs and even remote connect via dial in. Users see the system as a simple, transparent extension of their own PC. **#2. The Back End**–supports three levels of communications capabilities including: a) connection to an IBM host via SNA, and other hosts with two levels of support, terminal emulation and complete transparent access to host-provided services such as files, databases and mail. b) large systems with hundreds of PCs implemented at multiple locations by interconnecting multiple servers. c) connection to public data networks. **#3. Services**–supports base level services including a shared file system, printing, mail, network time/date and full backup and recovery.*

Banyan Systems Incorporated

Banyan has developed a family of products that moves computing into the age of totally integrated communications and efficient information management.

Banyan designs, manufactures and markets *Virtual Networking Systems* products that offer a truly integrated architecture for computer communications. This architecture integrates personal computers, workstations and mainframes into a comprehensive information network.

For example, the Banyan Network Server is a *Virtual Networking System* product that provides the kind of communications that a comprehensive information systems strategy requires.

BANYAN

Banyan Systems Incorporated
Marketing Communications Department
135 Flanders Road
Westboro, MA 01581 Telephone: (617) 366-6681.

For more information on *Virtual Networking Systems* call or write Banyan Systems.

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CW11485

For the Banyan tree, life begins as a small plant in the limbs of a host tree. A network of vines drops to the ground and takes root. They grow thicker and stronger until each vine is like an individual tree trunk. Where there soon appears to be a virtual grove, there is really only one tree–a single interconnected Banyan.

Continued from page 52

Kernighan and Ritchie C language specifications. The package consists of a macroprocessor, a compiler, a relocatable assembler, a linking loader and a support library and utilities. C86 is priced at $1,495, the vendor said.

Alcyon, 8716 Production Ave., San Diego, Calif. 92121.

FORMULA CONSULTANTS, INC.
Shared Library Subsystem

Formula Consultants, Inc. has announced a Shared Library Subsystem (SLS) for users of its System for Tape Administration and Reporting software on Sperry Corp. 1100 series processors.

SLS is a communications interface that is said to allow two or more Sperry 1100 machines to operate as independent systems and share a common tape library. The product reportedly permits separate systems to exchange information.

Price for the SLS software is $4,000 for the first two machines and $1,600 for each additional machine.

Formula Consultants, P.O. Box 544, Anaheim, Calif. 92805.

COMPUTER INFORMATION SYSTEMS
Quantum RS

Computer Information Systems (CIS) has announced Quantum RS, a menu-driven resource management system for Digital Equipment Corp. VAX-11 processors under DEC's VAX/VMS operating system.

Quantum RS reportedly combines departmental and project resource accounting, budgeting and chargeback, performance analysis, capacity planning, cost tracking and both summary and session accounting. It monitors and bills for system resource usage on single VAX systems, VAX clusters and networked VAXs connected via Decnet.

Billable resources are said to include connect time, CPU time, page faults, buffered and direct I/O, volumes mounted, pages printed and disk storage. The package also maintains information on 35 resources and more than 30 statistical measures. System resources are accounted for on several levels: node, account, project, user, and objects — for example, batch and print queues, images, terminals and priorities.

Quantum RS is priced at $4,500 for single VAX systems. A session accounting option costs $1,000, and a networking option costs $2,500.

CIS, 165 Bay State Drive, Braintree, Mass. 02184.

FISCHER-INNIS SYSTEMS CORP.
EMC2 Version 2.1

Fischer-Innis Systems Corp. has announced an enhanced release of its EMC2 electronic mail system for IBM

Continued on page 58

PILOT from page 49

zable hierarchical menu system.

Perhaps the most interesting feature of the product is its ability to navigate down to greater levels of detail.

For example, if a manager is looking at an income statement and sees that sales commissions are over budget, he can click the mouse over that number and receive a more detailed breakdown by sales region. He can then move the mouse to the total sales figure for a region and click in to get a further breakdown by sales representative.

Command Center also employs a number of routines to compare data with budget, overall economic indicators, previous year's performance and the like. It can also be used for exception reporting to alert the user to a figure that is off-budget by more than a specified percentage.

Divergent approach

Pilot's approach to the micro-mainframe link is also worth noting because it diverges from existing products in two fundamental ways. For one thing, most products assume that the user wants a link only to the production data base. Pilot argues that corporate executives are more interested in comparative historical data — the kind that usually was dumped to tape long ago.

Pilot also attacks the assumption that micro users want data loaded into a spreadsheet or data base on the micro. Rather, it believes that executive users are not interested in learning to use a spreadsheet. They want data available quickly in a consistent format, and they want a few powerful routines to play with it. Command Center has some hooks into Lotus Development Corp.'s 1-2-3, but that certainly is not its strong point.

This should not be taken as an endorsement of Command Center. The product's demonstration is impressive, but demonstrations do not reflect the real world.

For one thing, to use Command Center effectively, users need a clear idea, in advance, of what data they want to use and how they want to use it. In real life, this is rarely the case.

Pilot's demo does not show what happens when the user clicks that total sales number and finds that the data is not available. Building a Command Center data base obviously takes some time.

Pilot also expects that its customers will be willing to devote a VAX or an IBM virtual machine exclusively to Command Center. While Friend said a VAX-11/750 should be able to support at least 30 concurrent users, that is a more expensive option than just giving your executives a Personal Computer.

Nevertheless, Command Center is one of the most interesting and unusual end-user products to come along recently.

IBM
popped the question

McDonnell Douglas
said "Yes"

McDonnell Douglas is proud to announce
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Data General, Digital Equipment Corporation and now IBM.
Think about it... McDonnell Douglas has created a complete
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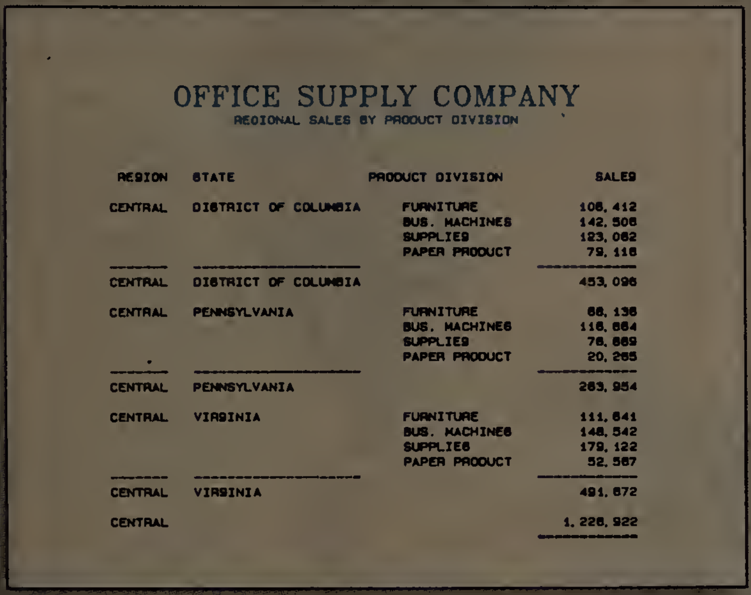

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                 OFFICE SUPPLY COMPANY
            REGIONAL SALES BY PRODUCT DIVISION

REGION   STATE                  PRODUCT DIVISION        SALES

CENTRAL  DISTRICT OF COLUMBIA     FURNITURE           108,412
                                  BUS. MACHINES       142,508
                                  SUPPLIES            123,062
                                  PAPER PRODUCT        79,118
-------  --------------------                     -----------
CENTRAL  DISTRICT OF COLUMBIA                         453,098

CENTRAL  PENNSYLVANIA             FURNITURE            68,138
                                  BUS. MACHINES       116,664
                                  SUPPLIES             78,869
                                  PAPER PRODUCT        20,265
-------  --------------------                     -----------
CENTRAL  PENNSYLVANIA                                 283,954

CENTRAL  VIRGINIA                 FURNITURE           111,641
                                  BUS. MACHINES       148,542
                                  SUPPLIES            179,122
                                  PAPER PRODUCT        52,567
-------  --------------------                     -----------
CENTRAL  VIRGINIA                                     491,872

CENTRAL                                             1,228,922
                                                  ===========
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Take a quick look at sales by state.

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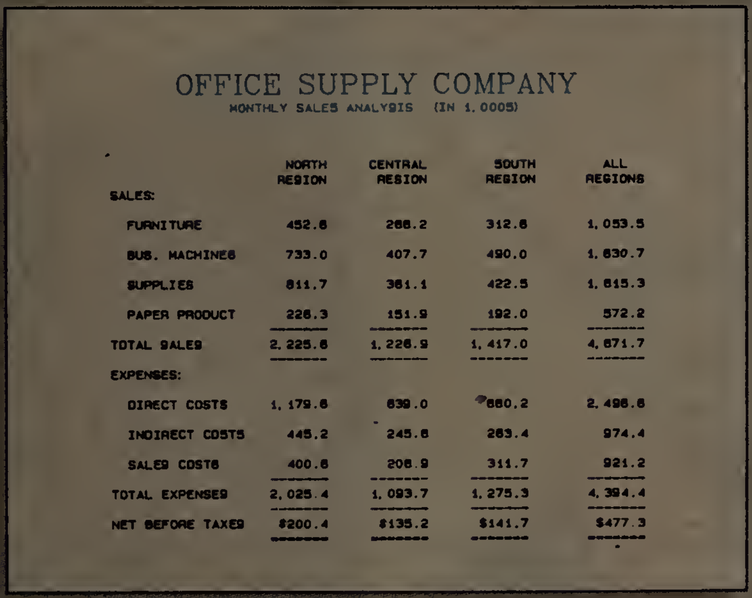

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                   OFFICE SUPPLY COMPANY
            MONTHLY SALES ANALYSIS   (IN 1,000S)

                      NORTH     CENTRAL      SOUTH        ALL
                     REGION      REGION     REGION    REGIONS
SALES:

  FURNITURE           452.8       268.2      312.8    1,053.5

  BUS. MACHINES       733.0       407.7      490.0    1,630.7

  SUPPLIES            811.7       381.1      422.5    1,615.3

  PAPER PRODUCT       228.3       151.9      192.0      572.2
                    -------     -------    -------    -------
TOTAL SALES         2,225.8     1,228.9    1,417.0    4,871.7
                    -------     -------    -------    -------
EXPENSES:

  DIRECT COSTS      1,179.8       639.0      680.2    2,498.8

  INDIRECT COSTS      445.2       245.8      283.4      974.4

  SALES COSTS         400.8       208.9      311.7      921.2
                    -------     -------    -------    -------
TOTAL EXPENSES      2,025.4     1,093.7    1,275.3    4,394.4
                    -------     -------    -------    -------
NET BEFORE TAXES     $200.4      $135.2     $141.7     $477.3
                    =======     =======    =======    =======
```

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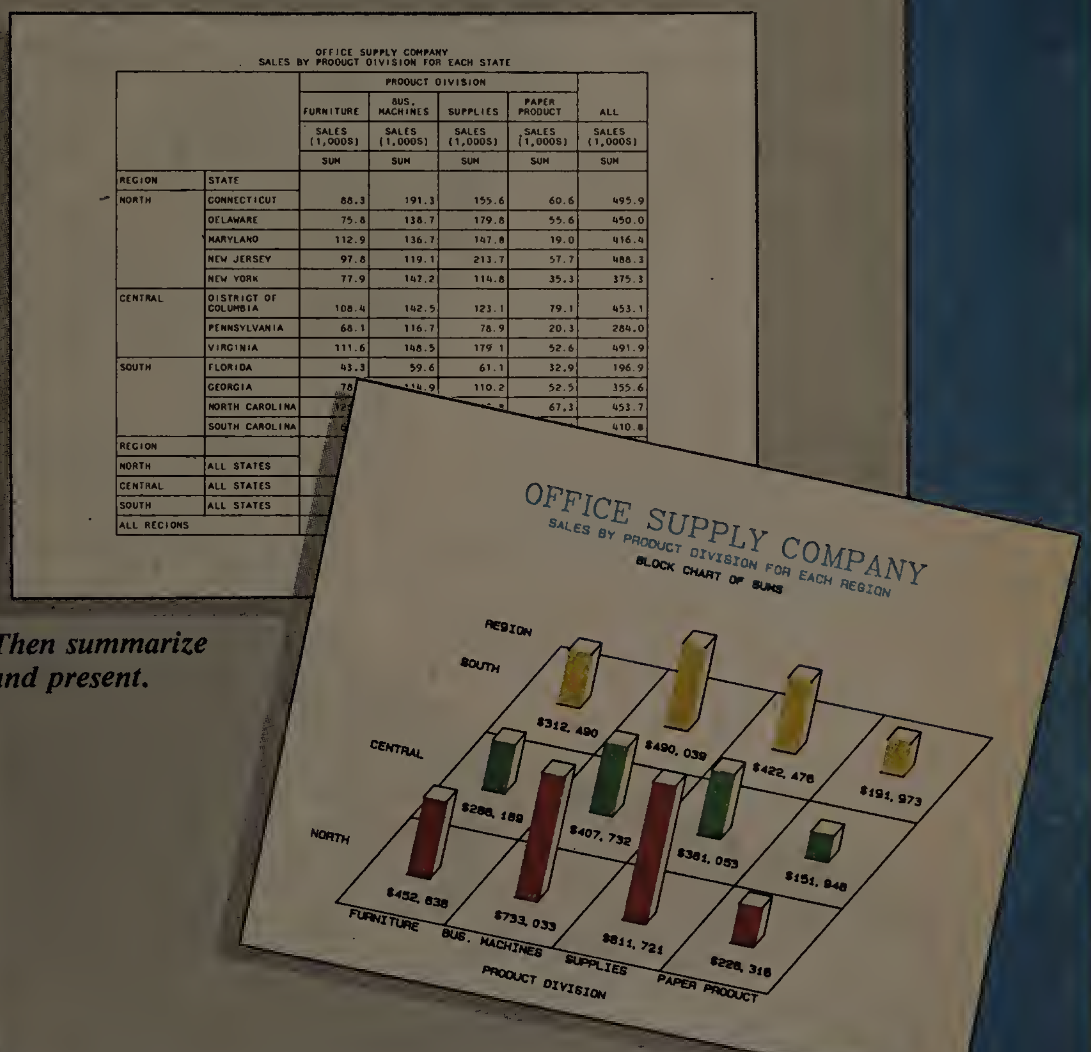

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                         OFFICE SUPPLY COMPANY
               SALES BY PRODUCT DIVISION FOR EACH STATE
+----------------------------+-----------------------------------------+---------+
|                            |            PRODUCT DIVISION             |         |
|                            +---------+---------+---------+-----------+         |
|                            |         |  BUS.   |         |  PAPER    |         |
|                            |FURNITURE|MACHINES |SUPPLIES |  PRODUCT  |   ALL   |
|                            +---------+---------+---------+-----------+---------+
|                            |  SALES  |  SALES  |  SALES  |  SALES    |  SALES  |
|                            |(1,000S) |(1,000S) |(1,000S) | (1,000S)  |(1,000S) |
|                            +---------+---------+---------+-----------+---------+
|                            |   SUM   |   SUM   |   SUM   |   SUM     |   SUM   |
+-------------+--------------+---------+---------+---------+-----------+---------+
|REGION       |STATE         |         |         |         |           |         |
+-------------+--------------+---------+---------+---------+-----------+---------+
|NORTH        |CONNECTICUT   |     88.3|    191.3|    155.6|       60.6|    495.9|
|             |DELAWARE      |     75.8|    138.7|    179.8|       55.6|    450.0|
|             |MARYLAND      |    112.9|    136.7|    147.8|       19.0|    416.4|
|             |NEW JERSEY    |     97.8|    119.1|    213.7|       57.7|    488.3|
|             |NEW YORK      |     77.9|    147.2|    114.8|       35.3|    375.3|
+-------------+--------------+---------+---------+---------+-----------+---------+
|CENTRAL      |DISTRICT OF   |         |         |         |           |         |
|             |COLUMBIA      |    108.4|    142.5|    123.1|       79.1|    453.1|
|             |PENNSYLVANIA  |     68.1|    116.7|     78.9|       20.3|    284.0|
|             |VIRGINIA      |    111.6|    148.5|    179.1|       52.6|    491.9|
+-------------+--------------+---------+---------+---------+-----------+---------+
|SOUTH        |FLORIDA       |     43.3|     59.6|     61.1|       32.9|    196.9|
|             |GEORGIA       |     78  |         |    110.2|       52.5|    355.6|
|             |NORTH CAROLINA|         |         |         |       67.3|    453.7|
|             |SOUTH CAROLINA|         |         |         |           |    410.8|
+-------------+--------------+
|REGION       |              |
+-------------+--------------+
|NORTH        |ALL STATES    |
|CENTRAL      |ALL STATES    |
|SOUTH        |ALL STATES    |
+-------------+--------------+
|ALL REGIONS                 |
+----------------------------+
```

Then summarize and present.

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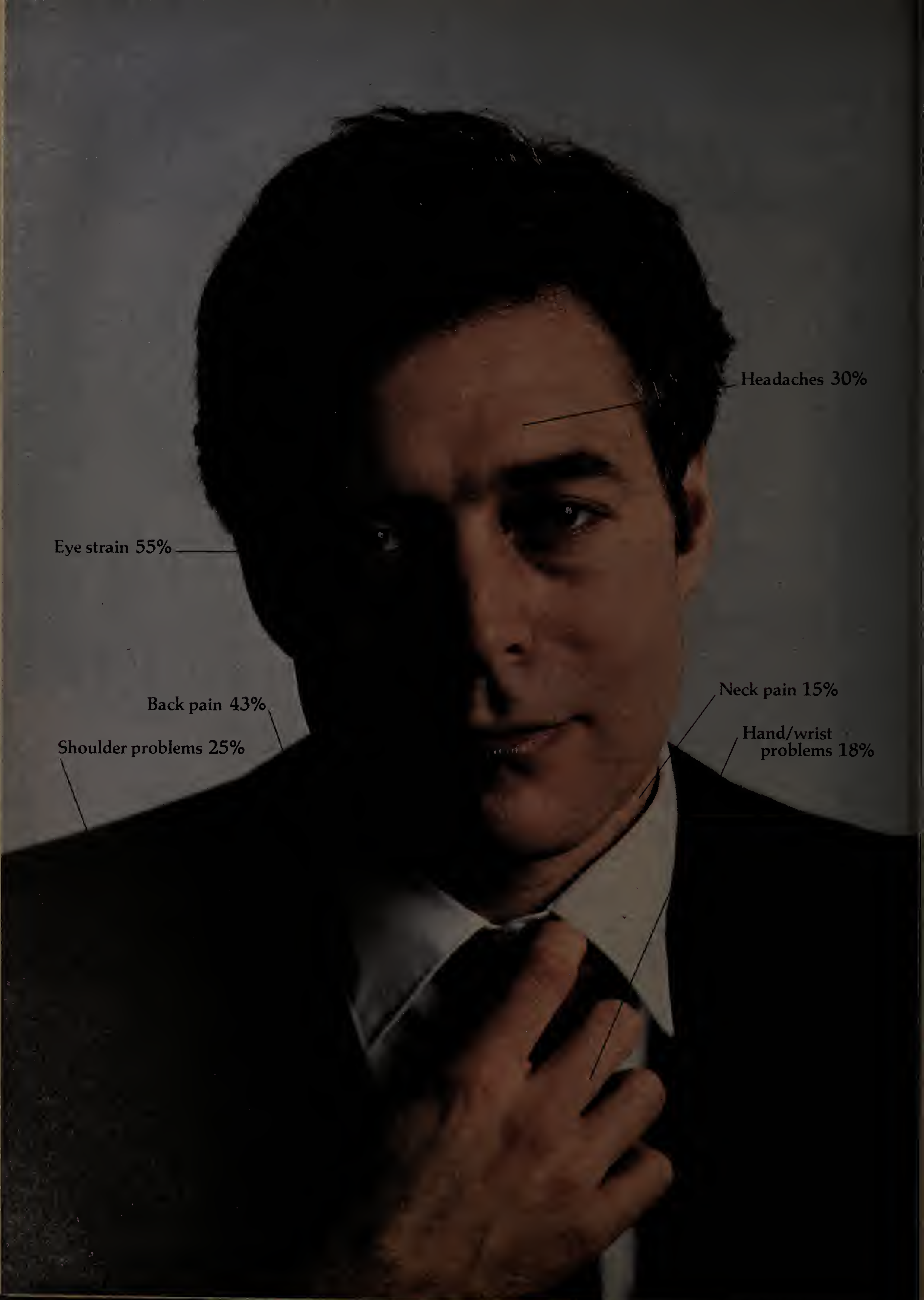

Headaches 30%
Eye strain 55%
Neck pain 15%
Back pain 43%
Hand/wrist problems 18%
Shoulder problems 25%

Computers can only perform as well as the people who use them.

The chart below is disturbing.

It shows the kinds of problems computer users are having.

[illegible]	
Eye strain	55%
Back pain	43%
Headaches	30%
Shoulder	25%
Hand/wrist	18%
Neck pain	15%

(Source: "Ergonomic Principles in Office Automation" Pub. 1983 by E.I.S. AB, Sweden.)

(Source: "Ergonomic Principles in Office Automation." Pub. 1983 by E.I.S. AB, Sweden.)

Before you dismiss them as trivial, consider two things:

First, more than twenty states are now preparing legislation to protect computer users from problems like these.

Second, it's not just a people problem.

It's a business problem.

Because computers do what they're told.

And if someone with a headache or eyestrain is doing the telling, they're likely to make mistakes.

Quite clearly, it's in everyone's interest to solve the problem.

You are not a machine.

As you would expect, computers are designed by engineers.

They usually know a lot about technology but very little about people.

And even less about ergonomics.

Which is why so many computers are technically impressive yet strangely unnatural to use.

Ericsson, in its very Swedish way, has always believed that excellent ergonomic design isn't a privilege.

It's a right.

That it isn't just a noble gesture.

That it's demonstrably good business.

Because computers can perform only as well as the people who operate them.

It's an attitude that has made Ericsson No. 1 in Europe twice over:

As the giant of European telecommunications.

And as the biggest European workstation company by far.

(You couldn't ask for a better marriage of technology for the future.)

Here is one example of how Ericsson got there.

It's the first of a whole range of computers to be introduced in the U.S.A.

IBM is a trademark of International Business Machines Corp.

The Ericsson PC. It's Ergo-Intelligent.™

Ericsson has spent $300 million finding ways to make computers more ergonomically intelligent.

Here are some of the results.

Ergo-Screen.™

Aspirin gets rid of a headache. Ergonomics gets rid of the cause.

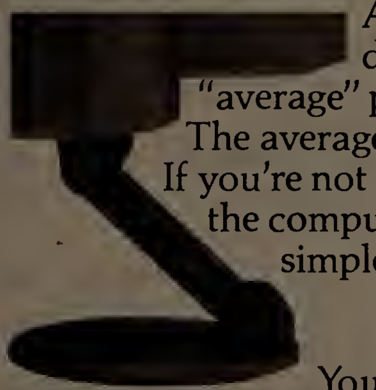
The characters are amber on a specially developed low-fatigue background color.

Even the shape of the characters was specially developed to allow easier recognition of difficult to distinguish letters like O and Q.

On the monochrome monitor, the resolution is double that of IBM's, so clarity is remarkable.

You can even have text and graphics at the same time.

Ergo-Arm.™



A computer is designed for the "average" person.

The average person is 5'9."

If you're not that height, the computer world has a simple answer.

It's your problem.

Ericsson disagrees.

Your monitor comes with an Ergo-Arm that lets you move and angle your screen exactly where it suits you.

Far better than back pain, wouldn't you agree?

Ergo-Touch.™

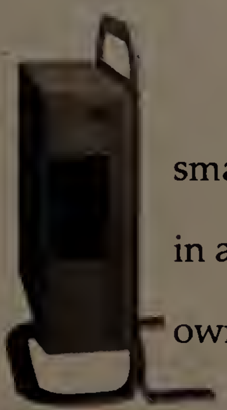
The keys are full-size and the layout is ergonomically planned for greater accuracy and speed.

Yet the keyboard is 20% more compact and less than half the weight of IBM's.

Even the cord is adjustable to suit left- or right-handers.

Ergo-Color.™

Even the color of the case is ergonomically selected to be restful to the eye over many hours.



Ergo-Space.™

The system unit is one-third smaller than IBM's.

It even fits under your desk in a special vertical rack.

So your desktop is your own again.

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Many companies claim to be compatible.

Some are. Some are stretching the truth.

The Ericsson PC boasts the highest compatibility rating there is.

It's operationally compatible.

You can take advantage of thousands of PC-compatible programs already available.

In fact, with the best-selling software, program and data disks are interchangeable with those of the IBM PC.

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Ericsson wouldn't give you anything less than on-site or carry-in service.

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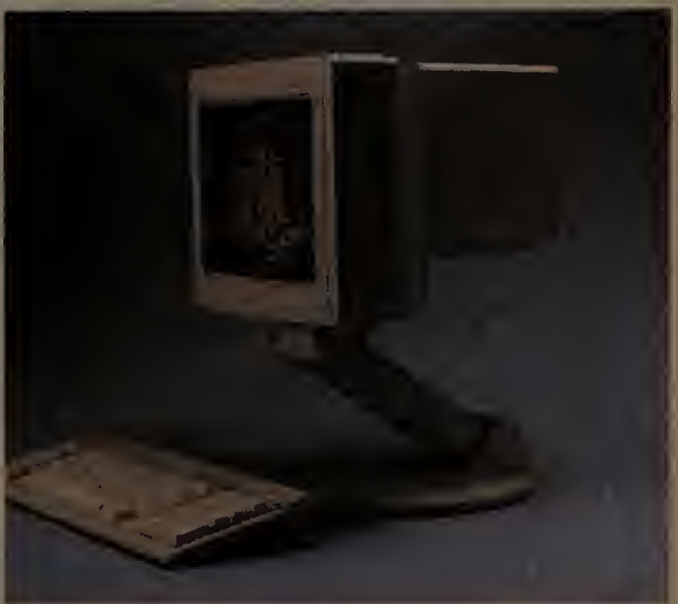
Ericsson will send you revealing literature on ergonomics.

Also a detailed brochure on the Ericsson PC.

And arrange a hands-on test if you ask for it.

Call toll-free 1-800-FOR-ERGO.



ERICSSON

Continued from page 54

370 series mainframes. It runs in IBM MVS/TSO; VM/CMS; VS1; and DOS/VSE. It also runs under CICS in the MVS, VSE and VS1 environments. EMC2 may also be used as a separate IBM ACF/Vtam application.

Version 2.1 of EMC2 is said to include priority mail notification for TSO and CMS users, security enhancements, calendar display upon log on, a "surrogate" feature that allows a user to designate up to two other persons who may access and update his calendar and support for fixed block architecture devices.

EMC2 may be leased for between $500 and $800 per month. It may also be purchased for between $20,000 and $30,000, depending on the host environment.

Fischer-Innis Systems, 4175 Merchantile Ave., Naples, Fla. 33942.

MOM CORP.
PC/COM Release 3.5

Mom Corp., a division of National Product Marketing, has announced that its PC/COM software has been adapted to link the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatibles with IBM mainframes running IBM CICS, CMS and TSO.

PC/COM Release 3.5 reportedly runs with all leading printed-circuit boards that emulate IBM 3270 terminals and IBM Systems Network Architecture/Synchronous Data Link Control and bisynchronous controllers.

The product allows the micro in local or remote locations to become an integrated workstation with access to the mainframe, a company spokesman said.

According to the vendor, PC/COM has file management capabilities that allow the user to manage mainframe and micro files interchangeably and has a facility for creating and deleting files, editing data within a file and renaming, copying, displaying or printing files.

PC/COM originally was designed for Digital Communications Associates, Inc.'s Irma board but is now available for emulation boards produced by Forte Data Systems, CXI, Inc., Quadram Corp., Microplus Systems, Avatar Technologies, Inc. and Intelligent Technologies International Corp.

PC/COM for a mainframe using CMS or TSO costs $400, for a mainframe running CICS $2,000 and for each personal computer $395.

Mom, 2 Northside 75, Atlanta, Ga., 30318.

PROGRAM ACCOUNTABILITY & EVALUATION, INC.
Librarian/38

Program Accountability & Evaluation, Inc. has introduced a tape and diskette inventory system for the IBM System/38 running under IBM's CPF operating system.

According to a spokesman, Librarian/38 provides computer shops with a method of keeping track of tapes and diskettes. The package provides information on tape location, display of entire inventory, hard copy reports and a copy spool file utility that allows a user to save, restore and reprint a spool file without inputting IBM commands.

Librarian/38 costs $300.

Program Accountability & Evaluation, 7 Riverway Road, Salem, Mass. 01970.

ARKANSAS SYSTEMS, INC.
RPG Generator

Arkansas Systems, Inc. has announced a Report Program Generator (RPG) that generates IBM RPG workstation programs to maintain data files on IBM System/34 or System/36 minicomputers.

The RPG Generator reportedly can be used as an alternative to the Data File Utility's Enter/Update facility, a company spokesman said.

The software is priced at $450.

Arkansas Systems, Suite 201, 8901 Kanis Road, Little Rock, Ark. 72205.

INMON from page 49

enthusiasts focused on coding practices and analysis of function as the key to success. Function was decomposed, programs were modularized and changes in program flow of control were carefully handled.

A watchword of the day was "form follows function," which was interpreted to mean that data structures were a by-product of process design and functional analysis. For systems being built at the time — which were almost exclusively tape-bound, sequentially oriented systems — the structured techniques represented an advance over the free-form design and coding that preceded the structured approach. The pendulum had swung firmly to a focus on process design and implementation.

But as shops left the sequential environment for the data base environment where many functions used the same data, the techniques of structured analysis proved to be less than satisfactory. The pendulum rapidly swung to data analysis where data was normalized.

Just as the structured advocates focused on processes at the expense of data, the early data analysts focused on data at the expense of processes. Many felt that if a shop could just get its data structures right, then systems would at last become stable. This second major step in the evolution of information engineering filled in many holes left by the structured way of thinking and represented a significant advance.

But as shops began to build more data base systems, a very low degree of integration among the systems was usually noticed. While data bases solved many of the problems of sequential systems, no discipline required that data bases be integrated. The pendulum then began to swing

See **INMON** page 60

bāk´lôg

n. An ancient affliction of MIS departments, resulting from overwhelming demand for mainframe applications systems and programs. Unknown since the development of The Intelligent Assistant, circa 1985.

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*Source *Datamation Magazine 1983 Brand Preference Study* of printer preference by end users and OEM's.

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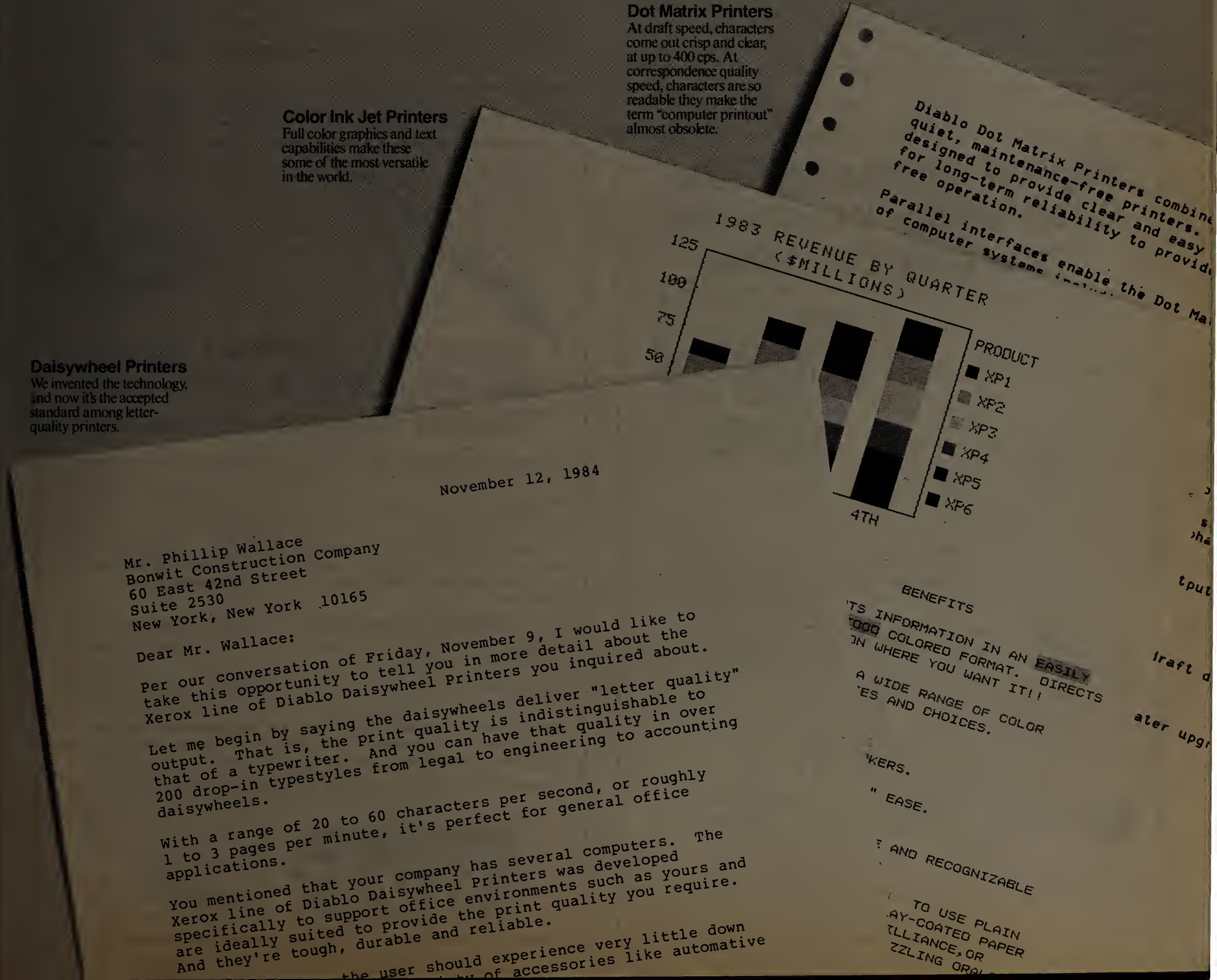

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November 12, 1984

Mr. Phillip Wallace
Bonwit Construction Company
60 East 42nd Street
Suite 2530
New York, New York 10165

Dear Mr. Wallace:

Per our conversation of Friday, November 9, I would like to take this opportunity to tell you in more detail about the Xerox line of Diablo Daisywheel Printers you inquired about.

Let me begin by saying the daisywheels deliver "letter quality" output. That is, the print quality is indistinguishable to that of a typewriter. And you can have that quality in over 200 drop-in typestyles from legal to engineering to accounting daisywheels.

With a range of 20 to 60 characters per second, or roughly 1 to 3 pages per minute, it's perfect for general office applications.

You mentioned that your company has several computers. The Xerox line of Diablo Daisywheel Printers was developed specifically to support office environments such as yours and are ideally suited to provide the print quality you require. And they're tough, durable and reliable.

the user should experience very little down of accessories like automative

INMON

from page 58

away from pure data analysis toward a balanced approach of analyzing data and processes in equal measure. Building an integrated system requires that the same data be perceived in many ways. To achieve multiple perspectives, processes and data are necessarily and equally interrelated.

There is an appropriate analogy that can be made. Sequential systems (and structured approaches) view data linearly. Data base systems and data analysis view data in a two-dimension fashion. Integrated systems and integrated approaches look at data in three dimensions.

Chapter 6 of my book, *Integrating Data Processing Systems In Theory and in Practice* (Prentice-Hall, Inc., 1984) gives a more complete description of this perspective.

What information engineering tools and techniques are being used effectively today? What are people doing today to achieve the integrated environment effectively?

One noticeable advance is the advent of software aids for the information engineer. While flowchart automation has been available for many years, today's software tools deal with the data modeling aspect of the system integration.

While data dictionaries are adequate to hold a repository of data as it is defined at the implementation level, data modeling makes use of different levels of data structures that may or may not be appropriate to a traditional data dictionary.

Another advance has been the realization that several levels of modeling and analysis are necessary to come to grips with today's large, complex systems.

These can be characterized as global level, middle level and local level (see Figure 1 page 49).

The different levels of modeling, which are appropriate to both data and processes, are necessary to deal with the size and complexity of today's information systems. The global level is used to give perspective to all parts of the system — how they relate, how they are positioned and how they interface with each other. This level is devoid of most detail — something many data processors loathe to abandon. Typically found at the global level are entity relationship diagrams and a breakdown of the basic functions of the organization.

Different systems require different numbers of modeling levels. A very large, complex system may require five or six levels, while a simple system may require only one or two.

At the middle level, the specifics of the model begin to appear. Here is found minimum structure models, data item sets and detailed functional decomposition.

At the lowest level of modeling comes the detail necessary for the actual building of the system. Because of the higher levels of modeling, redundant data and functions are recognized and combined. Found at this level are the familiar record layout and program specification. The integrated, engineered environment arrives at the same implementation level as the nonintegrated, nonengineered environment, but the derivation of the processes, the data at the implementation level and the ensuing capabilities of the systems are drastically different.

It is worth noting that different systems require different numbers of modeling levels. A very large, complex system may require five or six levels, while a simple system may require only one or two.

Each level of modeling builds upon the higher, less detailed level. At the higher level, the emphasis is on the structure of data and process — how major parts fit together — while at the more detailed levels, the emphasis is on accuracy of detail and content. The result is a balance between the organization systems and the content of the systems.

The techniques of information engineering have evolved as data processing has evolved. Data flow diagrams, for example, are very appropriate to the tape-oriented sequential environment with many master files and redundant data flows from one file to the next. But in the integrated environment, redundancy should not be a factor. Data does not flow in an integrated environment, thereby making data flow diagrams obsolete.

In its place has risen prerequisite/transformation data that is appropriate to the integrated environment. The only flow that occurs is between different modes of operation — operational to archival, operational to decision support and so on. The flow between modes of operation occurs on a global level.

An important success factor in building engineered, integrated systems is establishing the scope of integration. In developing small, nonintegrated systems, there is either no need to outline the boundaries of development because the system is small or the scope is implicitly defined and understood by all parties.

But in large, complex systems that require information engineering, there is a definite need to outline formally at the outset what will be in and out of the development effort. Without the scope of integration properly defined, an architecture might be developed that later needs major modifications simply because the development effort was misunderstood. A clear identification of the scope of integration allows the developer to build all that belongs in the system in the proper perspective.

Next week, Inmon looks at where information engineering is headed.

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Forecasters predict that the Australian government and businesses will increase their usage of microcomputers by 170% over the next two years. **Australian Micro Computerworld** is the only monthly magazine covering this market. Written for both single-unit and networked users, most of our 12,000 readers are skilled professionals involved in the selection or design of systems and networks.

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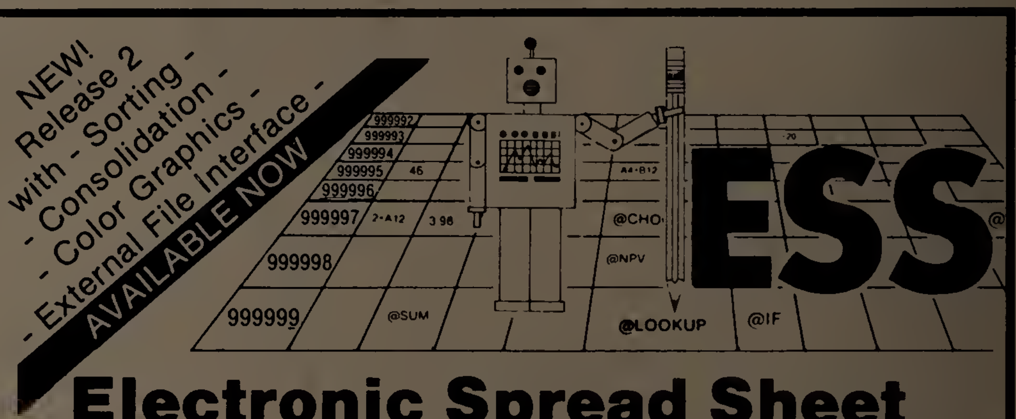

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- 30 Medicine/Law/Education
- 40 Wholesale/Retail Trade
- 50 Business Service (except DP)
- 60 Government—State/Federal/Local
- 65 Public Utility/Communication Systems/Transportation
- 70 Mining/Construction/Petroleum/Refining
- 75 Other User ______

Vendors
- 80 Manufacturer of Computers, Computer-related Systems or Peripherals
- 85 Computer Service Bureau/Software/Planning/Consulting
- 90 Computer/Peripheral Dealer/Distributor/Retailer
- 95 Other Vendor ______

2. **OCCUPATION/FUNCTION (Circle One)**
- 11 President/Owner/Partner/General Manager
- 12 VP/Assistant VP
- 13 Treasurer/Controller/Financial Officer
- 21 Director/Manager/Supervisor DP/MIS Services
- 22 Director/Manager of Operations/Planning/Administrative Services
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 35 OA/WP Director/Manager/Supervisor
- 38 Data Comm Network/Systems Mgmt
- 41 Engr/Scientific/R&D/Tech Mgmt
- 51 Mfg Sales Reps/Sales/Marketing Mgmt
- 60 Consulting Mgmt
- 70 Medical/Legal/Accounting Mgmt
- 80 Educator/Journalist/Librarian/Student
- 90 Other ______

3. **COMPUTER INVOLVEMENT (Circle all that apply)**

Types of equipment with which you are personally involved either as user, vendor or consultant
- A. Mainframes/Superminis
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems

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IN DEPTH

An index of 1984 In Depths and Special Reports

In Depth presented 130 stories in 1984, full-length features on topics such as micro Cobol, mindware, the Pick operating system, documentation, optical storage, subsecond response time and models for management. We interviewed the chairman of the Codasyl Cobol committee and the heads of Guide and Share, the IBM user groups. We ran articles by such authorities as J. Daniel Couger, C.J. Date and T. Capers Jones. We excerpted from *Techno-Bandits* and *Technostress*.

And each month, the Special Reports section provided dozens of tutorials and applications stories focusing on a single topic.

This index is intended to help readers locate articles on particular subjects of interest from last year. To order a back issue, write: Back Issues Department, Computerworld, P.O. Box 880, Framingham, MA. 01701. Each issue costs $2, prepaid by check made out to Computerworld. Issues published on Jan. 9, Feb. 27, June 4 and Sept. 24 are not available.

In Depth articles:

Jan. 9	Gene Knauer	The rise of the technical writer
Jan. 9	David Robinson	Information systems — the power in your hands
Jan. 9	Gregory Parsons	Where information power can change your company
Jan. 9	Casimiro Alonso	A case for Mumps
Jan. 16	J. Daniel Couger	Lessons from the best-sellers Part 1: In search of DP excellence
Jan. 16	Tobey Marzouk	Negotiating, drafting, executing and enforcing employment contracts
Jan. 16	Richard Raysman	The law of the industry, 1984
Jan. 16	Jack Rahaim	Who's in control here?
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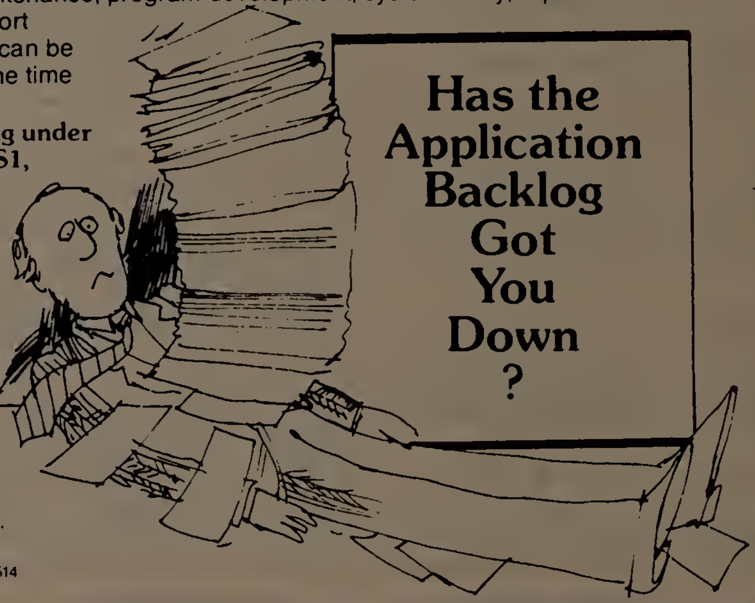
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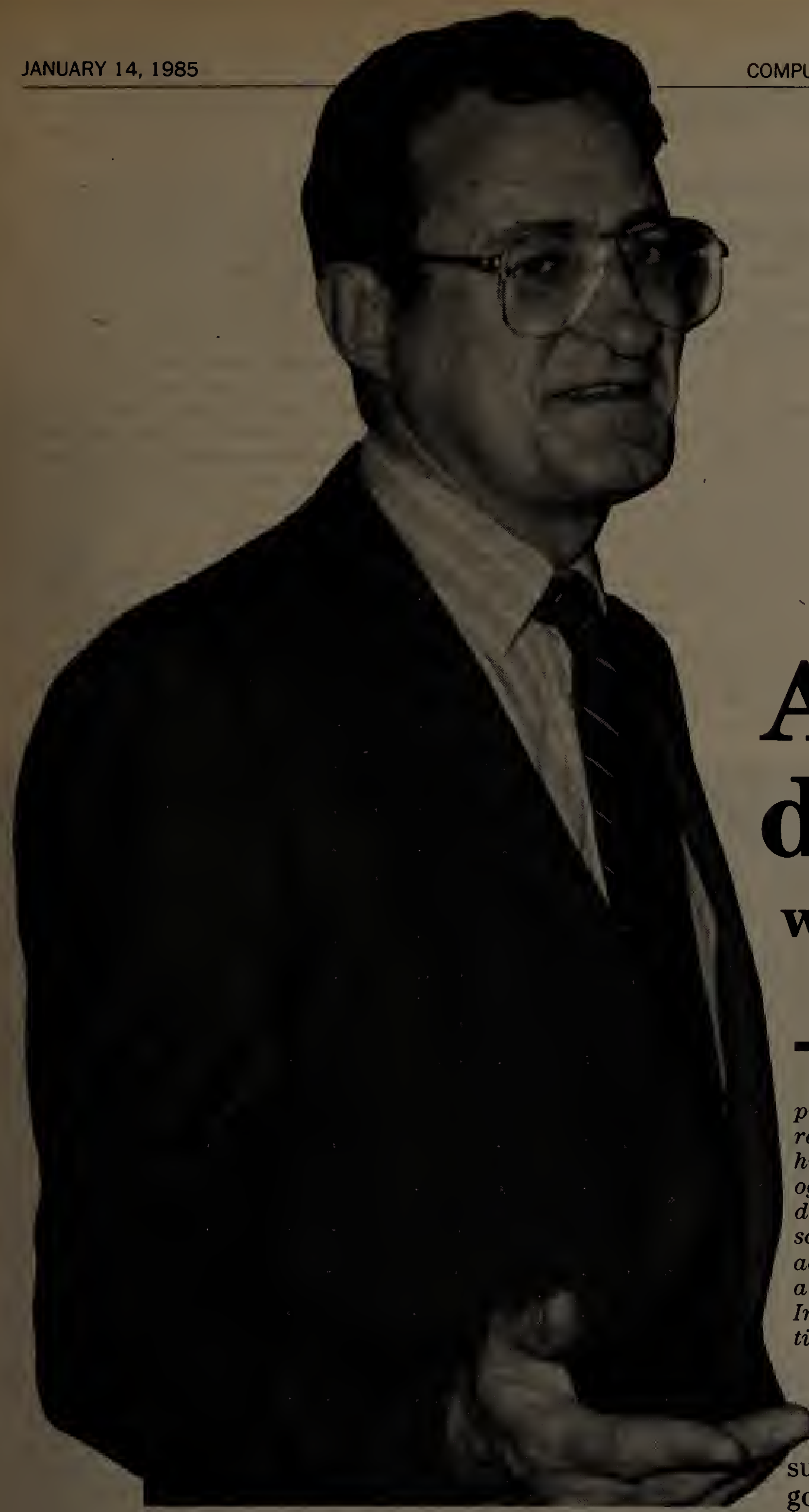

A walk through decision support

with Peter Keen

Peter Keen has been described as a principal mover and shaker in the realm of decision support. He chairs his own firm, Informational Technology, Inc., and serves as managing director of its UK subsidiary, Infoscope, in London. The following is an adaptation of his address last fall to a meeting of FCS-EPS Users Group International, sponsored by Evaluation and Planning Systems, Inc.

I see a natural, lateral development between the fields of DSS and DP. It's certainly true that DSS needs good DP technicians, people who understand data management. It's also clear that DSS has the bridge heads out in the organization that DP needs.

Over the last two years, the ideas in the area of decision support systems (DSS) have gotten rather flimsy, to put it politely. If anything, the ability to build systems has gotten ahead of the thinking about which systems to build.

In the next transition for DSS, the question of linking back up with data processing, integrating the organization resource is becoming key. DSS has gotten trapped into small applications without data, and there is an energy crisis. The personal computer partly accentuates it.

As one goes from an [Apple Computer, Inc.] Apple II at 64K bytes to a personal computer at 128K and then up to 512K, one certainly doesn't say, "Good, I'd like to run bigger spreadsheets." One starts looking at data being the key determinant. Powerful models link to data work accessing. And to me, that is no longer a technical question. There are lots of people working on that and the question for technical integration is not if, but when. The question for organizational integration is if.

And the other issue, too, is that the tools we have are being under-exploited. That is, it has been very easy to get trapped into being a DSS builder, taking lots of little applications and then more of the same. Very few DSS groups have managed to build a career path and a mandate. They tend to be doing more of the same. They tend to be good but at the same time trapped into reacting to people's immediate needs.

One thing one has to think of is: What are the decisions that matter in an organization? What are the things that we would really like to affect? What does it mean to have a DSS business plan?

Who is your target market? Is it middle-level planners in the organization? Is it senior managers? Is it marketing? Putting those all together is essential now because DSS is in danger of getting blurred with just being end-user computing.

And what's different about it? Why do we bother to call it DSS?

The old definition of DSS has always been to take any available and suitable technology and use it to help improve managerial decision making. The definition I would suggest we need to work on now is: "DSS is about using any technologies — intellectual, analytic, financial and computer — to help improve creativity in decisions that really matter." It's going to be very important for DSS organizations to exploit the quality of software, to find decisions that matter.

Decision support is more important than DSS. There is no decision support system, per se. There's no particular technology about which you would say, "This is DSS." DP is using the same technologies. The question is: "What do you want to work on?" And here, the main focus is identifying single management tasks.

To a large extent, DSS has been identified with personal decision making, and then when the micro came along, we started talking about personal computing. I'm flagging things that are key, not because we've done them badly, but because they are opportunities we must pick up.

We must get away from personal computing and look at organizational computing and organizational productivity and organizational decision making. One of the questions we have to ask is: What are the applications opened up by access to remote data and first-rate communications links?

DSS was an early warning signal to DP that the world was changing. There's a whole new world class of technologies and a whole new class of applications. And unfortunately, those of us involved in the field very much viewed DP as a sort of inferior form of blue-collar worker, and the snobbery implicit in Scott Morton's and my book is frankly inexcusable.

DSS became a political opposition to DP and that split has taken a long time to fuse. First of all, though, DP was being foolish. It didn't recognize that a free market for computing was emerging, that there were interesting new things to work on. When DP did not pick them up, DSS went in to financial application areas, to the first class of end users who understood data and understood models. Therefore, there has been a split, a political split, between DSS and DP.

Now, surely DP needs DSS as badly as DSS needs DP. One could argue that DSS has been the dry run for office technology. What you learned in DSS is how to build systems for nontechnical users where you don't have functional specifications and how to market systems in such a way that people choose to use them. DSS was the first discretionary system where people could vote with their fingers. If they didn't want to use DSS, they wouldn't. DP was the mandatory system — you must use the payroll system and reporting systems.

At that point, DSS was a very radical view. And even now some of us are still living in the next stage where DSS got way ahead of DP.

DSS is about fast development. It's a service, not a product. And DSS people have always put a premium on being able to handle ad hoc needs very, very quickly. That has a cost. It's very hard to plan next year's activities if you are always going to be available, just picking up odd jobs.

A warning signal for all DSS organizations is when to start thinking about a product portfolio, service portfolio, a business plan and an integrated delivery rather than just picking up whatever management wants them to work on next. But certainly in the period 1975 to 1980, DSS developed a tradition of adaptive design.

DSS was an early warning signal to DP that the world was changing. There's a whole new world class of technologies and a whole new class of applications.

I would suggest now that the next opportunity is to start thinking of DSS being really a new start of corporate thinking, corporate planning.

The real questions are not just doing "what if" extrapolations on the financial side of the organization but the why, where and what around the competitive side of the organization — a natural extension from "what if" to "why if."

But it was DSS that learned that you can build very complex systems out of very simple components. Prototyping is now so old that it's hard to think back to the days when it was never done, which wasn't that long ago. But DSS people have learned that you can, in fact, build full working systems very quickly. One thing we learned, in fact, is that using the fast development language APL or an EPS, you can generally put up an initial version of a model for $5,000 and 10 days of work.

The other rule of thumb was: If the data doesn't exist, it has to be collected and defined; then the simple rule for that $5,000 figure in 10 days is just put zeros on the end until you get bored. We really learned that it's very easy to build DSS if you are model-oriented and the data is either in the manager's head, subjective estimates or small-scale data bases that require infrequent updating.

But in cases where we are talking about data-oriented DSS, there is no question that we did not learn the skills to do it here. I found, to my cost, that DSS people are very good at the front end of a system's invention life cycle. They are good at getting things going. They don't have to have functional status. They can respond, they can experiment. They are good at the innovation on research and development for systems. And DP has always been very bad at

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that. We now begin to find as data-oriented models and integration become more key that DSS people are very bad at the things DP people are good at.

For example, most people in DSS couldn't spell the word "testing," let alone "documentation," because there is no such thing as a bug in DSS. First of all, you can't anticipate the bugs because you don't have known inputs and known dialogues. But more important, there isn't a bug — there is just a phone call from the guy you've been working with very closely that says, "Hey, there's something wrong with this." Good APL programmers can be recognized by their tilt to one side from five years of being able to hold the telephone while you repair a bug.

Now, we are beginning to put together innovation with discipline. Get going — get things working, experiment with the production side, the traditional systems and development life cycle. In your organization, you are no longer surely talking about building lots of little things. You're trying to consolidate a major organizational resource. And all of a sudden the skills of DP become key. DP is good at handling data, masses and masses of it. It is very good at the operations side and good at the problem of maintenance.

A good system contains its own obsolescence. As users work with a system, they start getting ideas, too. By the third year of a DSS, most of the improvements have been suggested by users. DP people are good at handling large-scale projects. In fact, the good habits of DP are bad habits for DSS. Too much bureaucracy and the good habits of DSS are bad habits of DP.

DSS became very independent from DP and is very model-oriented. One of the problems we have — and let's be honest about it — is that currently, the word DSS has become technobabble. You think of how our field lives on cliches. It's very hard to sort out what is just babble in this field from what really is the top, intellectual idea.

DSS is dangerously close in many organizations to just being sort of another information center. Or is it the same as end-user computing? The identity issue is key. We might ask the question: What would we lose if we just got rid of the term DSS? End-user computing is as good a term, or is it? The thing that makes it different is the D — Decision.

It's not a question of using computers. Whereas DSS was independent from DP, now DP is using exactly the same tools. There is nothing magic about the DSS tool.

Organizational solution

All the aspects of the organizational computing resource are moving more and more to the same tools for the same philosophy. What I find interesting about the information center is that it's an organizational solution masquerading as a technical solution. It allowed the good DP units to break out of the isolation trap and to build a marketing bridge head instead of being in operations and manufacturing units. Several of them made the mistake of assigning traditional Cobol programmers.

When we start looking at the 1980s, surely there are three things that have to be pulled together. One is DSS being integrated into MIS DP. Every time one generation fails, we rename it. So, operations research became management science, became decision science, whatever. And DP has become information services, information systems, MIS.

But, more important, all three of them have to be merged with office technology — not office automation. Surely we are not naive enough to think that this time we can repeat the awful lessons of data processing in trying inappropriate automation.

You can't have integration without a clear network plan. It's integration of the corporate network with intelligent workstations, which will carry some functions we call DSS, others which are much more traditionally in the office side of things — electronic mail or whatever. And many of them would also be vehicles for information access, which has been the game of DP.

It is extending current DSS activities to the managerial workstation. And I think we can identify what that looks like. I don't think there is anything that office technology needs that hasn't been part of the DSS tradition. Particularly the question of designing usable dialogues, making useful tools usable, the difference between implementation and installation. Installation is easy with modern tools.

You want the office of the future? We can make three telephone calls and it comes in on a truck. On the other hand, do you want to make electronic mail work organizationally? Then you want to make end-user inquiry things work culturally. That's implementation, a much longer activity.

I think the real distinction between traditional developers of systems and DSS people is that traditional people have mainly been concerned about the product, whereas DSS people have mainly been concerned about service. Office technology is in danger of suffering from two things. One is, it's too product-obsessed. It's like being in a candy shop. We never expected to have the quality of software and hardware that's available.

Every time something new comes out, whether it's a Hercules board or another graphics package, you wander in and you just grab. Office technology has been tool-obsessed and product-obsessed. But the other problem is this issue that office technology doesn't have a concept of architectural integration. Architecture is like the city blueprint. How do you get a blueprint that can hold up over changes in technology, volumes,

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users and mix of media? How do you make sure that dreadful word, "incompatibility," doesn't become a growing part of a firm or the vocabulary? Communications architecture, the data architecture and applications architecture have to put this together.

I suggest we're looking for the ability to integrate, not integration. Clearly, integration has been oversold. The new wave of products like [Lotus Development Corp.'s] Symphony are generating a backlash. How many operating systems could we really say are moving toward integration? But we have to go in that direction. Every aspect of this requires "integratability." We used to talk about a migration part of computing. We're now talking about an integration part. Now when you look at integration from the point of view of the data base people and the communications people, you think in terms of standards and operating systems. That's looking from the inside out. What is the infrastructure, and what do we push out onto the workstations?

For DSS, it's the opposite view: Where are we going to put workstations? What do we want to put on them? How do we make short links back in? So when we choose an operating environment, we're concerned about integratability, and when we're choosing software packages now, the key issue is whether they allow us to move along that integration path.

The second problem is more concerned with communications; it's connectability. Can we make sure that, within reason, any of our target customers for the organization, inside or outside, can connect both to our network, and can we interconnect to theirs? The major battleground for industrial activities now is piggybacking. Things like electronic funds transfer or point-of-sale systems link one network into another to create new products. Integration of service is at the workstation. Airline reservations systems piggyback into providing car and hotel reservations.

So the connectability thing is very much a question viewed from the perspective of products and services in the communications environment. There is the assumption of one workstation, the computer equivalent to the telephone. And integratability is about which services can be provided, which devices can access which services. The sorting out of the DSS software market is very much going to be around these issues. Shareability is the micro-mainframe link extended.

Shareability is shareability of processes and data. Ideally, one would like to be able to have a single terminal accessing a whole series of transaction processes as well.

'Outside-in' view

Transportability I find very interesting. Transportability says, "Can we, in fact, move our applications and technology base into new geographies and new operating environments?" Actually, that's why the personal computer is integral to the architecture for DSS and for the organization. It's the outside-in view. Can we, in fact, standardize them, whether it's [Microsoft Corp.'s] MS-DOS or whatever, or can we choose a vendor that will allow us to move into many environments?

The most difficult environments to move into are international, where equipment that may work in one country isn't allowed to work in another country. For example, it's illegal to send a packet of any sort on any network whatsoever in France. Packet switching is a government monopoly.

As you look at that, the question of architecture starts jumping through. The goal of that architecture is, indeed, to allow us to gradually integrate DSS, MIS and office technology, not keep them separate. When we start negotiating with DP or talking with senior management, we spend less time talking about plans and more time talking about architecture. When we choose things like MS-DOS, it is not because it's the best system, it's simply policy choice eliminating design alternatives and eliminating arguments.

Little by little, we are zeroing in on how you set corporate standards so the whole resource has a chance of fitting together. That will be the sorting out of end-user software in the mainframe/ micro area. The question you

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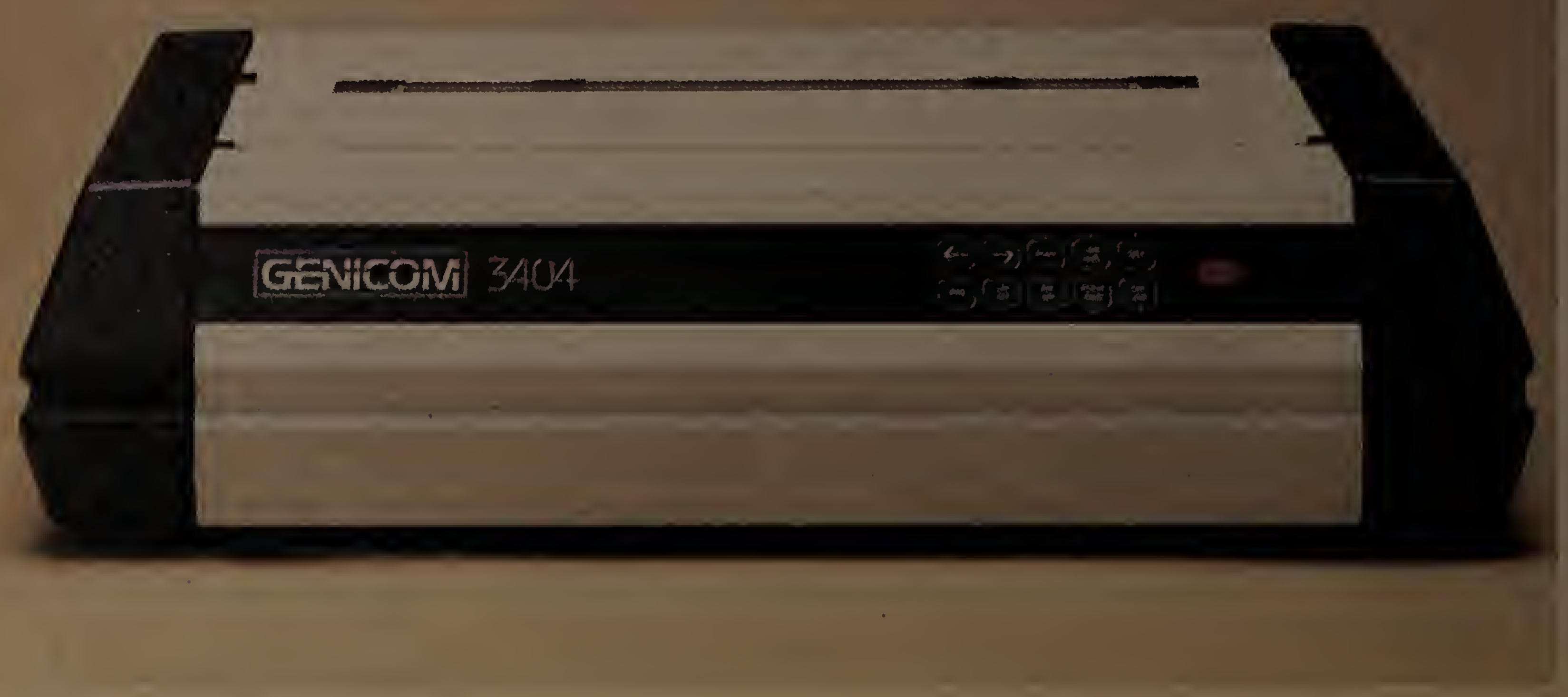

must look at when you are evaluating a company now is the architecture and not the functions. Most of the companies selling end-user software are now providing first-rate functions. It used to be five years ago at conferences or trade shows that there would be an ooh and an aah when one company unveiled goal-seeking or double precision or whatever. Now the products are so good you evaluate them and penalize them for the features they haven't got.

There are certain areas where we still need a lot of things. That's in high-performance and end-user data base capability, ones that can handle massive data bases, not the little things we handle now of merely 100,000 records and 15 updates a second. How do we organizationally link these two so that technical integration will occur?

DSS surely has become the mainstream. It has moved from being sort of a left-wing radical idea to just commonsense notions about how you operate in a user-controlled world. That's important.

I'm not a believer in user involvement. It's pseudo participation and it's like being an agnostic. Agnostics are people who, when they get to heaven or hell, want to say, "Well, I haven't really made my mind up."

It's influence and control that matter. We are moving toward DSS being a mainstream because more decisions about the use of the technology are being made by user managers. They're directing it, and our role is to become much more of a staff function, responsible not for the building of systems. Many DSS will be distributed as part of the normal distribution of effort that has taken place with DP. We are in charge of the architectures, the economies of expertise and the planning.

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There is no scenario for the 1990s which assumes a reduction in end-user involvement and a reduction of end-user computing and a return to traditional development methods. Now if that's the way we're going, then DP has some very big dilemmas, one of which is around policy. It used to be a monopoly. DP had the advantage of uneducated users and no alternative source of supply. The problem now is that it's a free market. Any one of your organizations could build a complete data processing resource outside in the free market. You want bandwidth? — there are plenty of data networks. You want facilities management? Minis? Micros? A data base? You really can put the whole lot together.

So the question for DP increasingly has become: Who's in charge and how do you regulate the free market? Which things require central direction and which have local autonomy? My own feeling is that you centralize every aspect of the communications architecture and the data architecture.

Then the question is: Are these guidelines with teeth? That's a real question now — which things really require central planning?

The highways issue is the key one — communications architecture. The policy for communications should be that anyone who violates it will be shot.

How much central direction should there be? When you talk about standards for integration with data, what does that mean? Is it a vice? Standards with teeth? And the issue coming from DP is: Who decides?

One reason computing is so political in organizations is there's a lot of ambiguity about which things fundamentally belong at the center. The other reason is, of course, that DP is short of development staff — not programmers. End-user development languages have shifted out part of the backlog. But the hybrids — the people who are technically fluent and literal about the business (fluent about the business, literal about the technology) — those are the key people. One can't think of building DSS without somebody who is a hybrid. Where is DP going to get the business-oriented analyst? Where are the people for office technology who understand the business and at the same time are good enough to handle the development issue?

If you look at companies' application plans for three years out, there is nowhere in the world they can get those hybrids.

The toughest area of all is going to be to get the people above the project leader level, the people who are heavily involved in the major application of families, office systems, DSS or whatever. Those people have got to be decent general managers and all the people who would be in those positions for 1988 have to be in the organization now. Because you can go out and buy technical expertise, it's a question of bidding up the market price. If you want CICS experts, how efficient are they when they come into the organization? 90%.

On the other hand, you go out and you want someone to work on building a competitive data base. How efficient are they when they come in — 20%? How long does it take before they understand the organization, the functions, the procedures? That's the crisis for DP. That's why I think the DSS people will be more and more critical to DP, because most people working in DSS surely have a very good understanding of some aspect of the business process. We have to start feeding DSS people back in to DP.

I see a natural lateral development between the fields of DSS and DP. It's certainly true that DSS needs

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really good DP technicians, people who understand data management. It's also clear that DSS has the beach-heads out in the organization that DP needs.

We've built MIS reports around the financials because those are the mule trains across the mountains, the best established pathways. Now even though we have a better technology, we tend just to be automating the same stuff so we may send the information by laser or satellite, which is like mule trains on amphetamines. Before we start exploiting DSS, the question is: What actually do the MIS managers want?

In many cases these decisions are about comfort. What would make your managers feel comfortable at 8 a.m. if they could switch on one screen of information?

That's where DSS and MIS link, and the new generation of executive information systems are around that. Let me give you one hasty example — Donald Reagan's information system, you'd call it DSS, when he was head of Merrill Lynch. He wanted to pull in all the account information and summarize in one graph the aggregate cash position in customers' accounts. If it has gone up for three days, the message is: "You have too much money sitting around; it isn't earning commissions." If, on the other hand, it starts to go down for three days, the message is to start looking at the margin accounts. That's comfort support. And that's really one of the major payoffs of DSS. Surely there is nobody who believes in DSS who doesn't feel it's relevant in the executive office.

And yet in practice, DSS has been trapped in the middle levels of organizations. And in many cases, when we talk about DSS being for managers, they are not for managers; they are for analysts and professionals. But DP has a major dilemma about how to take charge of this strategy.

DP now will purely be judged by its ability to serve. It's no longer a product question. The danger, of course, is that DP is talking about building a utility. Have any of you thought what a terrible job it is to run a utility? No one is ever grateful.

We have a utility operating here — the lights. We don't say, "Gee, isn't it wonderful, the value added that has allowed us to hold a meeting." If the damn lights go off, we will certainly moan, however. And that's the problem with a utility. The only measure of success for utilities is guaranteed 24-hour service, itemized billing, consolidated billing, guaranteed maintenance and, preferably, falling prices.

So any of you who use the word utility, you should polish your resume and move on. It's a thankless job.

But nonetheless, DP is building a utility. And the key value added to that utility benefits DSS. That is, it is the power saw, not the electrical utility, that creates the service. It's the workstation and what you put on the workstation that creates the benefit for that utility. So DP's dilemma is handling these. In many cases, it needs the things that DSS has done fairly well. But let's just take a look at DSS' dilemmas, which I think are more serious.

DSS has spent its time cherry picking. It is taking the little applications and doing them well and getting a lot of gratitude, finding urgent problems that can be solved with a small amount of technology. The trouble with cherry picking is, that is not the way to build an organization mandate and resource. And we do begin to see DSS builders who have terrific early careers and present lots of papers at conferences; three years later, they are a little frustrated because they don't seem to be able to get very far. And five years later, they've left, or they are either doing the same thing elsewhere or have gone to a consulting company.

How many people have built a real DSS career path? That may be impossible because the mandate is with DP.

How many people have built a real DSS career path? That may be impossible because the mandate is with DP. There will not be two mandates for the organizational resource in computing.

The mandate is where the data is, where the big systems are. As long as DSS is seen as an intruder, it will not be sharing in that mandate. One would ask people in DSS: What's your career path? They'd say: What career path? It's an area of extreme ambiguity. And again, it's tough to be a hybrid in any aspect of computing because being a hybrid destroys your career path.

What we are doing is taking people who are on a technical path or a business path and putting them to the middle. We're taking the good applications programmer and saying, "Hey, why don't you work in the information center building financial DSS." What that says is that he certainly doesn't have a technical career path anymore and clearly isn't a finance person. We're looking at DP, or in many cases, finance groups, to take people who had good organizational careers and pulling them in to be not very good programmers. So you don't have a career path until you can sell someone the promotion after next. Where's the promotion after next in DSS?

It means, though, that there are major difficulties for some of our best people in DSS. Where is the career path? DSS people may well

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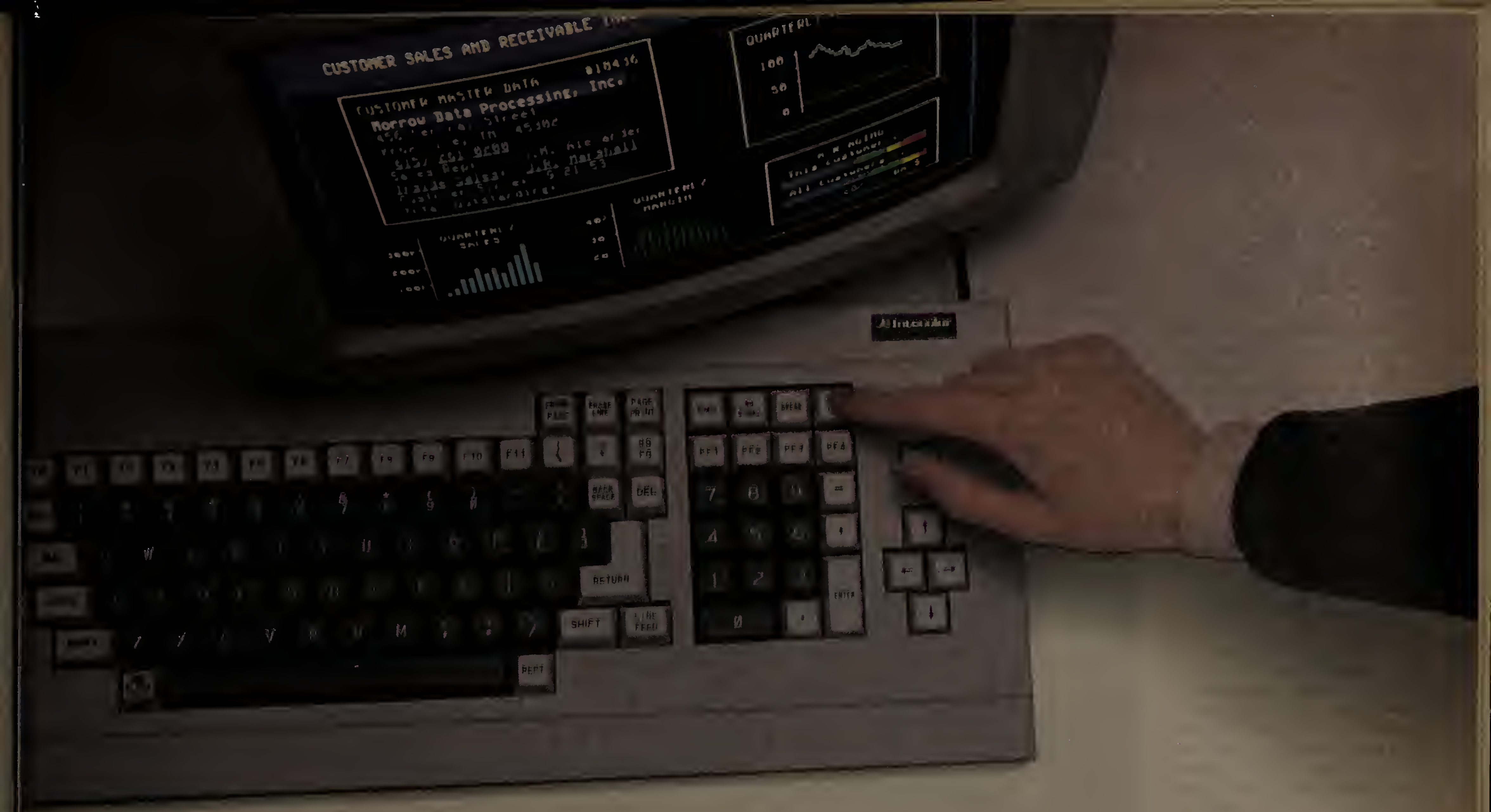

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move back into DP with a service orientation. They will move to create a new style of corporate planner, because that's what DSS really is about.

DSS-DP integration says: What DSS has is an understanding of users. It also has a design base that's very effective and certainly the most opportunistic of all fields. A DSS will use any tools that are available and suitable. I don't think there has been any innovation in computing that we haven't been able to pick up and exploit. Look at micros. There's no question they became a natural aspect of DSS development because they dealt with the problem of cost.

In distributed DSS, we are not just talking about distributing terminals, data, whatever. We're also distributing decisions. How do you build DSS with distributed decisions? It highlights the fact that the whole world converges on the intelligent terminal. That is, if you start with a stand-alone micro, you're going to lack communications. If you start with models, you're going to have an energy crisis and want data. If you start with the word processor, you're going to put in decision support systems only for budgeting.

So the question of building a corporate resource means that you have two choices which we can run in parallel. One has been traditional distributed processing, where we take a corporate resource, the mainframe, the data and start, through communications, distributing the workstations and then literally distributing the processing.

But we work from the inside out. Whereas what we are doing with DSS, or must do, if we have an architecture, is reverse distributing. What you say is, "Here, we'll find an interesting user, give that person financial planning capabilities, build some traditional DSS and then we'll work back to a host and data resource."

And in both cases, you have to have the architecture, and that really to me is what integration means. Now the trap for a lot of DSS people is that too often they think that what this is about is micro/mainframe downloading. It's not. It's really thinking through the questions of an architecture, integratability, transportability, connectability, sharability. It doesn't matter where you start.

Now, what that also says is that DSS is fundamentally concerned with where the workstation is and what it does. We want it to be with decision makers, people who matter, for decisions that matter.

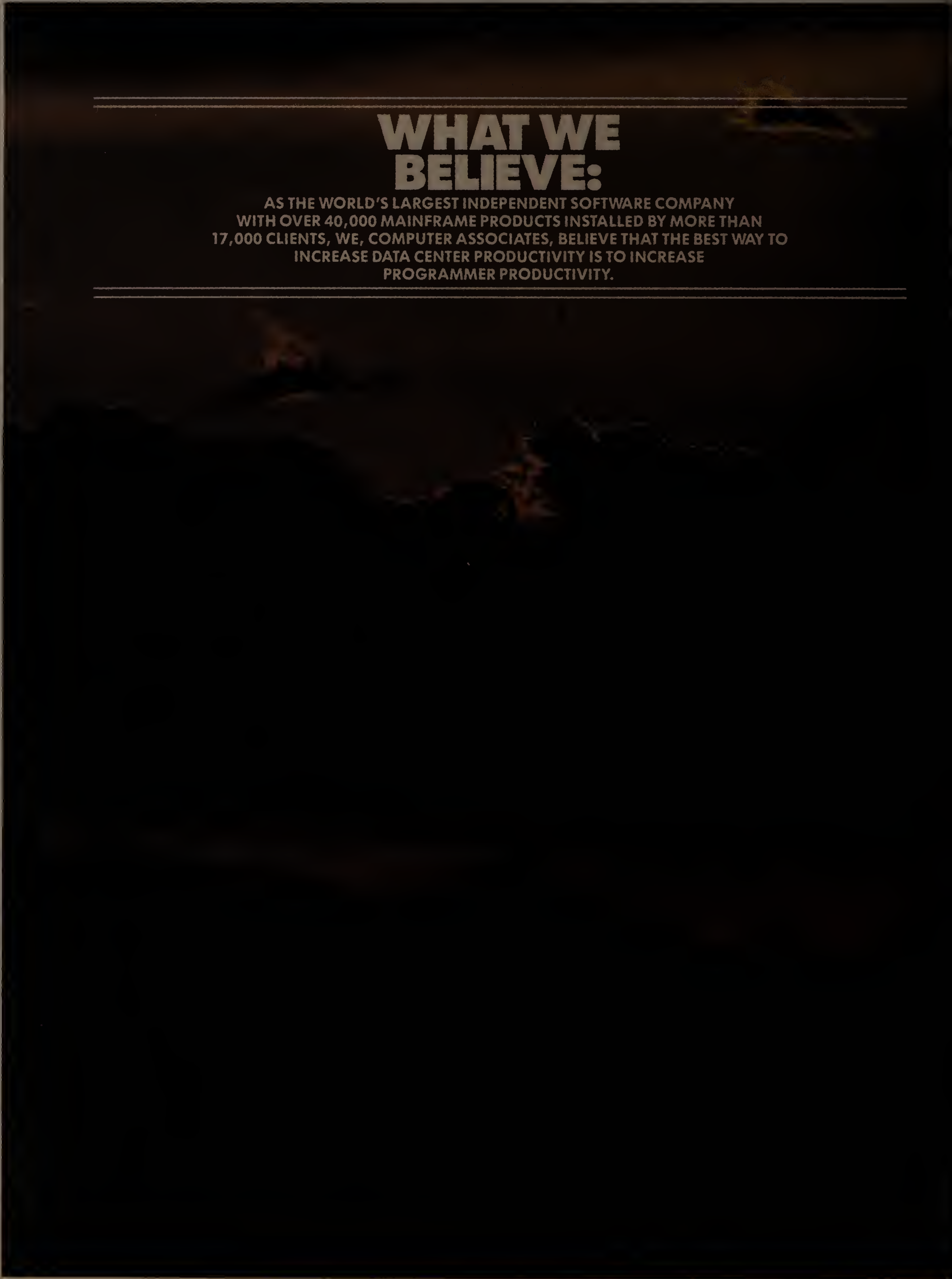
We can begin to say that in reverse distributed processing, we go the opposite way from data processing.

Talking about the multiservice workstation, I think we get a sense of what the components are. There is a basic capability which everybody has. Currently there is one terminal workstation for every 20 workers in the U.S. In the information-intensive industries, such as banking and insurance, or information-intensive departments within manufacturing and customer service, the ratio is not one to 20, but one to two. I don't think there will be a Fortune 100 company in 1986 that isn't in that ratio. That's one workstation for every two workers across the organization. If you believe in productivity, then that's a logical consequence.

That means that in many cases, it's the computer equivalent to the telephone. If one starts using PBX and moves towards the ISDN [integrated services digital network] concept, then in fact it will be a teleset, one workstation on each desk. If we're talking about one workstation for each two workers, then that workstation is a basic delivery vehicle for certain things now done through other media. Everybody surely will be using that as the standard information access capability — end-user information access.

But some people need the same information in aggregate form; some require it at the very detailed levels; some require small amounts; some can live with the recurrent monthly cycle; others need information in between.

We assume the basic capability of the workstation will be to deliver and access information — certainly for electronic mail. For organizations not to be using electronic mail is crazy. There's no system as cheap, as effective on added value and efficiency. Unfortunately, the lack of an architecture to integrate electronic mail is beginning to haunt companies.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> *As we move from DSS being for personal analysis and personal productivity to being part of the tools we use in ongoing decision making, then it's not DSS for making decisions but DSS for helping explain decisions.*

You can't have separate electronic mail networks. I love the word "incompatibility." It should appear in the dictionary as: "Incompatibility means it doesn't work." It's like that lovely phrase "99% debugged," which also means it doesn't work.

Budgeting and financial control and financial reporting will be done through that workstation. Now, a lot of what we've built in financial planning languages is no longer DSS. It's operational, it's ready to move from the high level we started at, to be pushed down. It's time to put it out into a typical DP environment. It's going to be large-scale use, so whether it's the 1-2-3s or whatever, or models built in any of the standard better end-user languages, they are not special anymore. But they've got to be diffused, because that's part of the basic capability. Now where DSS fits is very much around personal productivity.

DSS will always remain nonstandardized. They may, as with financial planning, get standardized and be pushed down to the basic capability. We have some people who like doing analysis, some don't. Some like graphics, some hate it. Some love lots of data. It's no big deal. One could argue that it's foolish not to be using DSS in certain areas. I think DSS is part of the discretionary aspect of the managerial workstation. And that means there's a distinction.

At the moment, we currently call financial planning and budgeting part of the same thing. One will get pushed down. When we look at personal productivity, we've got to recognize there are large target markets we are not serving as well as we should. When DSS started out, there were probably more marketing applications than there were finance. It moved rapidly into finance. Where do we want to put those workstations, and what do we want to put on them? The discretionary thing is key.

For example, many people don't like calendar management. I certainly don't. It will cause you to lose your last political weapon. To have your calendar known means you lose your autonomy. And surely, there must be people who made a decision which says, "If Fred ever phones, I'm busy." You want to be able to preserve little rules like that.

I'm intrigued by the fact that in many cases we have not recognized that as we move from DSS being for personal analysis and personal productivity to being part of the tools we use in ongoing decision making, then it's not DSS for making decisions but DSS for helping explain decisions.

For example, I don't think many people use graphics to make decisions. They certainly use them to convey decisions. And in certain areas, particularly marketing, graphics are absolutely fundamental. They just transform the ability to get your logic across. Similarly, conferencing is an optional capability. Conferencing is one of those things that is moving out of the learning curve.

What happens with all our technologies is that initially there is overselling. That is, if you look at life as an S curve, how long does it take to do the pilots and build things? When you start up with the pilot for videoconferencing or electronic mail five years ago or DSS, you say the office of the future is now and the cashless society will come in five years.

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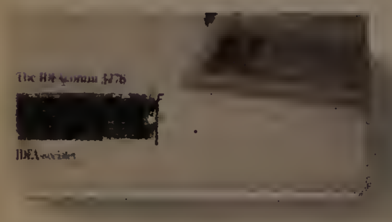

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except what you can do with a 32-bit machine instead of a 16-bit. You can't do anything with a stand-alone 32-bit machine in most cases unless you've got data.

CAD/CAM [computer-aided design and manufacturing], which could still chew up your 32-bit machines, is more interesting when you go to distributed CAD/CAM, the conveyance of designs and so on, the sharing of them. You know we've got a long way to go with integrated data resource management — and it will be slow. Videoconferencing — we've had a long wait, but that's really shaping up.

The point is, we've got to start thinking through in terms of that management workstation, the architecture for DSS. DSS is heavily involved here with special types of applications. The budget and management controls all may be using the same software base.

Decisions that matter

We should pay a little more attention to what decisions we would like to work on. Essentially, we are working on some very boring problems. There are lots of things we could be doing with that technology base.

The priority long-term targets for DSS have got to be decisions that really matter. Major ones are not around "what if," they are really around the fact that most business environments have moved to a level of volatility, partly because of deregulation. But the big question is not extrapolating the business plan and doing financial forecasting. It's really just answering questions like, "Who is our competitor now?"

My favorite example is hotels. There's no question that with deregulation of airlines, the airline reservation system will become the major integrated vehicle for hotel reservations. If you're a hotel, do you compete or do you incorporate with the allies? The area of EFT [electronic funds transfer] or point-of-sale systems is now shooting through the roof, so one of the most profitable banks in Florida is Giant Foods, which has one of the largest ATM networks. Do you compete? Do you incorporate? How do you think about your business?

What does it mean when Sears, American Express, Merrill Lynch and Citibank are fighting for the financial supermarket, and each one of them is in a different business? What does it mean to define a product? Now those are decisions that matter. And with the technologies we have in the training for DSS, we should start going into that.

If you're in the micro component business, surely short-term forecasting of back orders over the next three months and inventory levels is a much more complex problem than the relatively simple one of a one-year forecast.

There's a whole mass of analytic methodologies that somehow we seem to have lost in DSS. We've become too much a subset of a better style of developing systems. We ought to use a better style of thinking about how to help managers solve problems.

There can be no question that companies are haunted by the fact that too many of their decision-making processes assume out-of-date data. The other thing is, how do we help companies start getting a longer term planning horizon? A five-year plan is a short-term plan.

In technology in particular, 18 months is a blink of an eyelash. Can you get anything done with integrated computer technology that takes less than 18 months to think up the idea, get the equipment tested, designed and developed and make it operational. In banking, long-range planning is somewhere between 15 minutes and 24 hours. We say, "My God, we've got to do this quickly." We mean, if we work flat out, it's 18 months.

Simplicity is power

As companies become more dependent on technology and as markets shift, one of the things DSS people should be doing is starting to help people develop better models.

Too many of our models are at too micro a level of detail. We're building overelaborate models to give pinpoint estimates for short-term horizons. They are useful, but they're operational models.

The most powerful models tend to be very simple ones that help you understand your business better. And that's been a recorded statement from users of DSS. That's why they value insight, learning and understanding which variables matter. So we may be trapping ourselves in being a little too good at building operation models. We ought to pull back.

Now fairly obviously, one of the things this says is you better find a

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target market. Who are the people in the organization you would really like to influence? I suspect that means moving up a little higher into the marketing and product planning units. In many organizations, you already have DSS people in there. I think it's fair to say that finance dominates and finance will continue to dominate.

The other area is artificial intelligence. Where does it fit? We all face a big problem there, which is expectations. Senior managers have read *Business Week.* My guess is that if you asked most senior managers whether they expect expert systems to be in their organizations five years from now, you would get a much more optimistic answer than you would from the DSS people and the technicians.

We're all facing the question, "Hey, where do expert systems fit?" We don't want DSS to become the new enemies of change the way that DP was. We don't want DSS saying expert systems have nothing to say.

We are going to see a whole flood of new technologies we are not prepared to handle. I certainly do not in any way feel qualified to deal with logic programming or anything in AI. There's almost a technology gap coming for us.

The opportunity for DSS and decisions that matter is to start looking for semiexpert systems. For example, our interfaces in DSS are very passive. They just do "what if," like a staff assistant. "I want you to go away and calculate the impact of a 6% inflation rate instead of 8%. Come back with the answer." They're not very active.

> *It is a huge opportunity to be able to take the decision support methods of development and apply them to expert systems. I would argue that it's going to be the DSS people who build expert systems that work.*

An active one is a management science model, which tells you what the decisions should be. Moving DSS up to be a little more active, to be run like a good consultant instead of a software system, is very valuable. For instance, you think about what you like out of good advisors — they're devil's advocates; they teach you. In certain areas like auditing and finance, we ought to be able to find DSS where there's a limited semantics. How many words do you need in finance to cover the vocabulary? 100? Maybe 50. There's plenty of knowledge sitting around in textbooks.

Auditing and accounting are ideal, because they fit into the things expert systems do well, which is "if, then, elses." They are very rule-oriented. And it's easy to identify the rules. But how do we start attacking the question of what it means to be an expert manager? How do you even study expertise if you are building an expert marketing system or semiexpert one? How does one even think through the question of where you would work on it? DSS can probably wait a year or two before it deals with that. But it certainly is a huge opportunity to be able to take the decision support methods of development and apply them to expert systems.

I would argue that it's going to be the DSS people who build expert systems that work. Because the current ones are trapped to certain types of applications like clinical diagnosis, where the task is well defined and you get the rules out of people's heads. A very interesting thing about Mycin is not that it's a super system but how old it is — about 12 years old. And yet, it hasn't infiltrated into the culture.

When people talk about DEC's [Digital Equipment Corp.] VAX configuration, that's not an expert system in the sense of knowledge-based; that's just a series of very fast "if, then, else" rules. That's not a putdown, but it's really saying it may be DSS that helps pull that stuff out of the lab into practicality. What DSS people always do is describe first. You can't improve something you don't understand. You get a descriptive map of how things are done, how managers plan. Then a prescriptive map comes out of "they should or could." We're able to do things that the expert systems guys are going to have to learn, which is let systems evolve rather than build them.

Now consider executive information. Any DSS unit that isn't working on that in a company that has a network is failing to meet its responsibilities to the organization, especially if it's a private network. The nice thing about private networks is there's a time of day when they are free, called midnight. And the cost of transferring large amounts of information to the center is small.

What are the things that really matter in your organization? Is it marketing, new product development, cost displacement — all the things everybody knows are the hot buttons? And then, this strikes me to be a key: Who are the people whose productivity really is worth improving in your organization? That's the target market. Then one can talk about what their critical decisions are, their critical processes.

I really believe that this last 18 months has been an uneasy transition for DSS. There's not much going on in the ideas; the tools are pretty much in place. It has gotten a little boring, with too many easy things to work out.

The issue now is the recognition that the integration question partly stimulated from outside is not about integration of tools. It really is about how you move DSS back to being a key part of the overall computing resource.‡

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COMMUNICATIONS

WIRE TAP
Eric H. Killorin

MS-Net holds key to compatibility

Microsoft Corp. recently unveiled its Microsoft Networks (MS-Net), a series of networking protocols that will, when implemented by local network companies, allow IBM and compatible DOS-supported personal computers to exchange information across numerous types of network schemes.

The networking protocols are important not only to personal computer networks, but also — in the larger scheme of things — to IBM network compatibility.

Microsoft's MS-DOS operating system — Version 3.1 — combines the typical DOS operating system with new MS-Net protocols. These protocols conform to the fifth (session) and sixth (presentation) layers of the International Standards Organization's Open Systems Interconnect networking model and include file serving and print serving functions in the seventh (application) layer. Because MS-Net is closely tied to DOS, it provides a clean means of networking, as the network was designed as part of the operating system. This version of DOS also allows applications software to be adapted to operate in a network environment.

An arguable strength of MS-Net is that it allows network "transport" vendors (those providing networking hardware and lower level networking software, for example, 3 Com Corp., Interlan, Inc. and Ungermann-Bass, Inc.) to adopt MS-Net. Although many of these firms already have their own higher level protocols, they must develop a hook into MS-Net and, more pointedly, conform with IBM.

MS-Net is already supported by 23 vendors, including the companies mentioned as well as Digital Equipment

See **PROTOCOL** page 66

Killorin is president of Hyatt Research Corp. in Andover, Mass., and editor of "PC Netline," an industry newsletter covering personal computer networks.

Telenet posts Telemail options

Additions include hard copy, worldwide delivery

VIENNA, Va. — GTE Telenet Communications Corp. has announced four enhancements to its Telemail electronic mail service. The enhancements are said to include hard copy delivery and international connections.

The company said its Telemailxpress will include two delivery options, first-class mail delivery and overnight express delivery.

It reportedly will allow Telemail users to originate messages on office or home terminals for routing to a Telemailxpress processing center and delivery through the U.S. Postal Service.

Available during first quarter

Telemailxpress, scheduled for availability during the first quarter of 1985, will cost $2 to $5, depending upon the desired options.

GTE Telenet also announced an agreement with RCA Global Communications, Inc. that will enable Telemail users to send telex messages.

Users reportedly will be able to receive telex messages on their own terminals and use Telemail features such as message forwarding, electronic filing, customized forms creation, bulletin board capabilities and on-line editing.

Also scheduled for the first quarter, the cost of the telex feature will include the applicable telex charge and Telemail connect time charge.

Telemail is priced at $4 to $14 per hour, depending upon the time of day and 5 cents per 1,000 characters transmitted, the company said.

Global message-handling standards

GTE Telenet also said it will support the international use of global message-handling standards developed by the Consultative Committee on International Telephone and Telegraph (CCITT).

According to the company, Telemailxpress will be the first electronic mail service to have systems connected internationally with software based on CCITT X.400.

The company said the first international connections will be with Canada, beginning in the second quarter of this year. Pricing of the service will be based on the Telemail fees.

GTE Telenet is located at 8229 Boone Blvd., Vienna, Va. 22180.

Microcom offers modem series

NORWOOD, Mass. — Microcom, Inc. has announced a series of error-correcting modems designed for full-duplex communications over dial-up lines.

The products are said to use the Microcom Networking Protocol (MNP), that was designed to correct transmission errors caused by noisy lines by retransmitting lost or incorrectly received data. The 2,400 bit/sec modems are said to be CCITT V.22-compatible with full-featured autodial and autoanswer functions.

The ZX/1200 and ZX/2400 modems are targeted at business minicomputer installations with asynchronous terminals and offer Hayes Microcomputer Products, Inc. compatibility.

The SX/2400 reportedly is a standalone upgrade to the Microcom SX/1200. It is said to feature autodial, autoredial, autoanswer, and independent speed and flow control.

The Era 2 2400 reportedly is a 2,400 bit/sec inboard modem for the IBM Personal Computer and allows dissimilar systems supporting MNP to transfer files.

The PC/2400 Modem is said to be a stand-alone modem bundled with software for the IBM Personal Computer and is intended for IBM Personal Computers that have no space for an inboard modem, according to the vendor.

File transfers among dissimilar systems

The Macmodem 2400 is said to be an enhancement to Microcom's Macmodem 1200 and allows file transfers among dissimilar systems such as the Apple Computer, Inc. Macintosh and the IBM Personal Computer.

The 2,400 bit/sec modems also operate at 300 bit/sec and 1,200 bit/sec, according to the vendor.

Scheduled for availability in the first quarter of 1985, they range in price from $799 to $999.

Microcom is located at 1400A Providence Highway, Norwood, Mass. 02062.

- Icot Corp. has announced a family of communications processors designed for use in point-of-sale and automated teller machine networks/**64**
- Micom Systems, Inc. has introduced its X.25 Network Control System for centralized monitoring and control of Micom Micro 800/X.25 Concentrator PAD networks/**64**
- Innovative Electronics, Inc. has announced a concentrator designed to tie NCR Corp. and Burroughs Corp. retail terminals into IBM Systems Network Architecture networks/**64**
- Genesis Electronics Corp. has announced the Cindi 200 series voice mail system for businesses with 50 to 100 telephones/**65**

INSIDE

Controllers/**64**
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Protocol Converters/**65**

Paradyne appends Pix product line with Pixnet-XL

LARGO, Fla. — Paradyne Corp. has added to its Pix/Pixnet product line a new member that can be used to extend the block-multiplexed ports on IBM and compatible hosts.

While previous Pix products applied only to byte-multiplexed channels, Pixnet-XL can be used to extend byte- or block-multiplexed channels of IBM and compatible hosts, making possible the remote location of high-speed printers, computer-aided design and manufacturing (CAD/CAM) systems, local-type terminal controllers and other peripheral equipment usually limited to the 200-ft restriction associated with these ports, the company said.

The Pixnet-XL system hardware and software are contained in control units, or nodes, which can be interconnected in a Pixnet network at speeds up to T1 (1.54M bit/sec). This maximum link speed reportedly can be achieved by using multiple lower speed links. Up to eight 56K bit/sec links can be supported among XL nodes, Paradyne said.

Because use of Pixnet-XL is transparent both to the hosts and peripherals being used, I/O control routines are created and maintained as they would be normally, the vendor said.

Target Pixnet-XL applications include support of a variety of remote devices, including laser printers, line printers, CRT terminals, check sorters and CAD/CAM devices. It uses the High-Level Data Control communications protocol with data compression to optimize transmission efficiency, according to the company.

The illusion of local attachment reportedly relieves the host processor of the burden of polling, error detection and correction normally associated with remote teleprocessing.

The company said the product utilizes a multiprocessor architecture, with each node containing a floppy disk, Winchester disk and 2M bytes of common or global memory that is shared by all processors across a common bus.

The Pixnet-XL operates with satellite, digital and analog lines and microwave media.

It is scheduled for availability during the first quarter of 1985 for $95,000 to $125,000 per link in a point-to-point environment.

Paradyne can be reached at P.O. Box 1347, 8550 Ulmerton Road, Largo, Fla. 33540.

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CONTROLLERS

DOELZ NETWORKS, INC.
Elite One

Doelz Networks, Inc. has announced a multipoint concentrator switch designed as an alternative to multipoint network schemes.

The Elite One reportedly creates a network link by interconnecting up to 60 switches, which set up virtual multipoint circuits providing a single shared path between ports. The product is intended to eliminate line redundancies, protocol adaptations and intervention by a telephone company when drops are added or deleted from the network.

According to the company, the Elite One is useful in asynchronous or synchronous environments that use several terminals tied to a central processor, such as airline reservation, banking and inventory control applications.

Terminals and cluster controllers reportedly can be attached to the Elite One's ports regardless of communications protocols. Polls, acknowledgements and messages are transmitted by the host to all drops, but only those terminals whose addresses are in the transmission may see and respond to the transmission, according to the vendor.

Elite One costs $5,640.

Doelz Networks, 18581 Teller Ave., Irvine, Calif. 92715.

ICOT CORP.
Crystalink 5000 Series

Icot Corp. has announced a family of communications processors designed for use in point-of-sale (POS) and automated teller machine (ATM) networks.

The Crystalink 5000 Series is said to enable a financial institution's mainframe to communicate with multiple ATMs in branch banks and POS devices in retail stores.

The Crystalink 5250 Dial POS Concentrator reportedly enables up to eight simultaneous transactions from standard dial-up credit authorization terminals to be concentrated over a single IBM 3270 bisynchronous link to a remote 5250. A maximum of 24 dial-up ports and two host links can be supported. The Crystalink 5250 is available now and costs $6,300.

The Crystalink 5330 ATM Concentrator reportedly performs similar functions in a direct-connect ATM network, allowing up to 100 ATMs to access a host through IBM Binary Synchronous Communication. It also features traffic balancing in the host link.

Available now, a Crystalink 5330 configured for 50 ATMs costs $8,500.

Icot, P.O. Box 7248, 830 Maude Ave., Mountain View, Calif. 94039.

VOICE/DATA COMMUNICATIONS

MICOM SYSTEMS, INC.
X.25 Network Control System

Micom Systems, Inc. has introduced its X.25 Network Control System (NCS) for centralized monitoring and control of networks of Micom's Micro800/X.25 Concentrator PADs.

The NCS is a turnkey microcomputer system designed to handle remote packet assemble/disassemble (PAD) functions, downline loading of PAD operating software, statistics collecting and reporting, troubleshooting and message broadcasting. The system also is said to keep records covering each PAD, its installation date and service history, its installed options and the person to contact in case of problems.

According to the vendor, NCS uses menu selection and groups packet-switching parameters logically with descriptive names rather than using cryptic numeric descriptors.

The NCS reportedly does not require a dedicated X.25 access link but accesses the network through a PAD supporting other computers and terminals. An NCS supporting up to 50 PADs costs $15,500, and one supporting 150 PADs sells for $16,500.

Micom Systems, 20151 Nordhoff St., Chatsworth, Calif. 91311.

INNOVATIVE ELECTRONICS, INC.
Netmaster

Innovative Electronics, Inc. has announced a microprocessor-based concentrator designed to tie NCR Corp. and Burroughs Corp. retail terminals into an IBM Systems Network Architecture (SNA) network.

Netmaster is said to be a multifunction concentrator that acts as a remote in-store processor in a credit card authorization and data entry point-of-sale system, eliminating the need for large Burroughs or NCR processors in individual stores.

Netmaster is a 16-bit computer that operates in conjunction with the IBM host or compatible host with an IBM 3705/25 front-end processor. It runs with an Innovative application software package under IBM CICS.

Netmaster is said to accumulate point-of-sale transactions and maintain the flow of data to the host. It reportedly preprocesses inbound and outbound data to reduce mainframe processing, translating IBM 3270 virtual screens for transmission to and from the front-end processor and providing mass storage of print data.

Each Netmaster reportedly can support up to 300 terminals.

The single-unit price is $3,500. Quantity discounts are available.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

HONEYWELL, INC.
Serial link and gateway

Honeywell, Inc. has announced a serial link and gateway for its DPR 1500 digital process reporter to allow its microprocessor-based recorders

and controllers to communicate with host computers.

The interface reportedly allows up to 31 DPR 1500s or UDC 500 universal digital controllers to use a single RS-232C port. It is said to let the DPR 1500 serve as a multiplexer that can acquire, linearize and transmit up to 30 analog input variables.

Users can download data and commands from the host to the DPR 1500 to record alphanumeric characters along with time and trend lines. The host can analyze incoming data and annotate the DPR 1500's data tabulations and trend records using the unit's dot matrix printer.

Communications between Honeywell process instruments and the gateway take place over shielded twisted-pair wires at 19.2K bit/sec for distances up to 2,000 feet.

A user-installed retrofit kit for installed DPR 1500s costs $700 after parts trade-in. For new users, the DPR 1500 costs from $3,800 to $4,800, and the gateway and link cost $780.

Honeywell, Process Control Division, 1100 Virginia Drive, Fort Washington, Pa. 19034.

GENESIS ELECTRONICS CORP.

Cindi 200 series voice mail

Genesis Electronics Corp. has announced the Cindi 200 series voice mail system for businesses with 50 to 100 telephones.

The Cindi 200 is said to provide a range of voice mail features, including message storage and retrieval, message forwarding, call placement, group messages, guest mailboxes, certified messages and password protection.

The system is said to work with a range of private branch exchanges, including Mitel, Inc.'s SX-100 and Harris Corp.'s 110, the company said.

The price for Cindi 200 with two ports and one hour of storage is $9,900, the vendor said.

Genesis Electronics, 103 Woodmere Road, Folsom, Calif. 95630.

HEWLETT-PACKARD CO.

18150JA software for X.25 verification

Hewlett-Packard Co. has introduced a software package for testing X.25 packet-switching problems. HP's 18150JA package works with the HP 4955A protocol analyzer.

Software tools reportedly include an X.25 link-level and an X.25 packet-level certification and an X.25 link-level emulation.

The product sells for $2,500.

HP, 3000 St., Palo Alto, Calif. 94304.

PROTOCOL CONVERTERS

PARADYNE CORP.

9403 protocol converters

Paradyne Corp. has announced two protocol converters that are said to let users add a variety of asynchronous devices to systems using Paradyne's Pixnet communications network.

The 9403 protocol converters reportedly allow asynchronous devices to appear as local IBM 3277 terminals. They communicate in Pixnet's 9476 protocol in point-to-point and multipoint applications. Terminals may be located remotely using leased or dial-up lines and can be used in conjunction with multiplexers, the company reported. Transmission is said to be from 2,400 bit/sec to 9,600 bit/sec.

The Model 9403-01 reportedly connects to a Pixnet through a single line and provides four ports supporting three terminals and a printer. Model 9403-02 is said to have eight ports and support up to seven terminals.

The Model 9403-01 costs $4,900, and the Model 9403-02 costs $5,900.

Paradyne, 8550 Ulmerton Road, Largo, Fla. 33540.

INNOVATIVE ELECTRONICS, INC.

MC 80/700

Innovative Electronics, Inc. has announced the MC 80/700, a compact protocol conversion unit for the IBM 3270 environment.

According to a company spokesman, the MC 80/700 is self-contained and uses a standard Type A coaxial connection into the IBM 3274/76 cluster controllers. The product is said to be compatible with all IBM environments, including Binary Synchronous Communication and Systems Network Architecture (SNA)/ Synchronous Data Link Control.

The MC 80/700 supports BSC as well as SNA Logical Unit 1 and 3 IBM data streams. Output can be provided in a formatted mode of 40, 64 or 80 char./line or in an unformatted mode of up to 132 char./line. The unit also supports a "transparent mode" of operation, which allows the attachment of virtually any Ascii output required for specialized host applications, the spokesman said.

The MC 80/700 protocol converter is priced at $1,495, according to the spokesman.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

DIVERSIFIED DATA RESOURCES, INC.

Rack-mount Hydra II

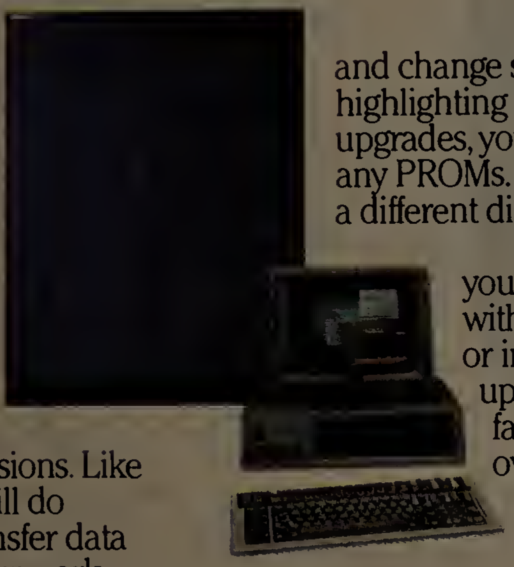
Diversified Data Resources, Inc. has announced a rack-mountable version of its Hydra II direct channel attach protocol converter/controller.

The unit, said to fit into a standard 19-in. electronics rack, has been redesigned with its plugs and cables in the rear, rather than the front.

The Hydra II is a byte multiplexer direct-channel attach device that is said to provide IBM 3278/3279 emulation for personal computers and

Continued on page 66

the smarter ~~desk~~ disk



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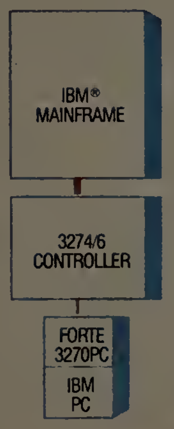

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COMMUNICATIONS

Continued from page 65

Ascii terminals and printers. Devices, whether attached locally or remotely via modems, appear local to the host, according to the vendor.

The rack-mountable versions are priced the same as the stand-alone models — $6,900 for eight ports and $9,900 for 16 ports.

Diversified Data Resources, 25 Mitchell Blvd., San Rafael, Calif. 94903.

INNOVATIVE ELECTRONICS, INC.

MC 80/900

Innovative Electronics, Inc. has introduced a microprocessor-based protocol converter that is said to allow any micro or Ascii terminal to access IBM mainframe environments and Ascii hosts concurrently.

The MC 80/900 reportedly makes the Ascii devices appear to the IBM host as IBM 3278 Model 2 display stations. It supports IBM bisynchronous or Systems Network Architecture/Synchronous Data Link Control communications protocols and connects directly by coaxial cable to an IBM 3274/76 cluster controller or to the display/printer adapter of the IBM 4331 host.

An auxiliary RS-232 port is said to allow an attached personal computer or Ascii terminal to have simultaneous pass-through access to an asynchronous minicomputer or public data base without requiring the user to log on and log off the active IBM host session.

The MC 80/900 costs $1,095, the vendor said.

Innovative Electronics, 4714 N.W. 165 St., Miami, Fla. 33014.

TELEPROCESSING PRODUCTS, INC.

TP-201

Teleprocessing Products, Inc. has announced an asynchronous-to-synchronous converter that is said to allow connection of an asynchronous terminal to a synchronous modem or digital data service link.

The TP-201 reportedly provides an asynchronous data rate that is equal to the synchronous modem or digital data link rate. It was designed to operate at strap-selectable asynchronous rates from 1,200 bit/sec to 9,600 bit/sec, matching asynchronous transmissions to the clock pulses of the synchronous link.

It costs $295.

Teleprocessing Products, Building 7K, 4565 E. Industrial St., Simi Valley, Calif. 93063.

PROTOCOL

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Corp., Hewlett-Packard Co., Intel Corp. and Texas Instruments, Inc. These companies will resell the MS-Net protocols with their current personal computer network product lines.

Although Microsoft supplies these companies with a target set of upper-level protocols, the file serving portion of MS-Net is inadequate. This an important concern, requiring MS-Net supporters — in order to be IBM network-compatible and competitive in the marketplace — to procure or develop their own file serving software that is at least as capable as the software for IBM's recently announced PC Network.

File server software

It is essential to adopt powerful file server software to ensure IBM compatibility. File serving is rapidly supplanting disk serving as the standard for personal computer networks. In most implementations, file servers enable files to be accessed individually, whereas disk servers require an entire volume to be pulled down to access a single file.

Creating file server software is no trivial task and will likely take most local network vendors a year to develop. Novell, Inc. of Orem, Utah, is one of the few companies that currently supports file serving.

Another key to IBM network compatibility is compliance with IBM's Network Basic I/O System (Netbios) and interface specification for IBM's PC Network. Netbios is central to the evolution of IBM networks, as it will be integrated with other IBM networks over time. A pending release of MS-Net will be compatible with IBM's PC Network program and will be tightly coupled with Netbios.

One advantage users of local net products built around MS-Net will have over IBM's own PC Network program is multivendor support. While the IBM PC Network will link only IBM Personal Computers, MS-Net, when combined with the lower- and middle-level software of local net transport vendors, will link many vendors' Personal Computers.

Sea of uncertainty

So, will MS-Net help part the sea of uncertainty surrounding PC Network buying decisions and help limit choices? Hyatt Research Corp. believes:

- MS-Net is integral to establishing a cohesive set of network options that, if implemented properly, allow mixing and matching of similar physical technologies, such as different Ethernet implementations.
- Microsoft has added an additional and much-needed part of the recipe for the development of applications programs for network environments. This is vital to the acceptance of local nets.
- As IBM's Netbios is carried over to subsequent IBM networks — such as its token ring — the MS-Net interface to Netbios should allow for upgrades from today's IBM networks to future IBM networks.

MS-Net does, indeed, provide consistency and a means to achieve IBM compatibility. Its technological approach, however, is not ground breaking. Further, supporters have the unenviable task of developing file server software equivalent to IBM's, which will not happen overnight.

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SYSTEMS & PERIPHERALS

Westinghouse, DEC link VAX, factory system

PITTSBURGH — Engineers from Westinghouse Electric Corp. here and Digital Equipment Corp. in Maynard, Mass., have merged DEC's 32-bit VAX family of CPUs with a Westinghouse system for factory automation, plant control and plant management.

The development is significant because it allows the Westinghouse WDPF distributed computer system to share one data base with a 32-bit CPU, cutting down translation time and CPU overhead, according to Robert J. Zabielski, manager of marketing communications in the industrial electronics division of Westinghouse.

Previously, translation between two systems was required because the WDPF system's data base communicated with another data base on a separate 16-bit CPU, Zabielski said. The link, with either the VAX-11/780, -11/760 or -11/750 running the VMS operating system, is said to provide the greater processing power needed for factory automation, he added. "Now, there is no gateway to go through. It's just connected to the drop as if it were an operating station," he said. (The drop is an industry term for the point at which individual devices connect to an electronic network. It could be a calculator, console, programmable controller interface or remote diagnostic tool.)

VAX applications software will have access to a plant's data base, allowing updates every second and consisting of up to 16,000 analog values or 256K digitals or combinations, without the mainframe computer overhead of traditional data-linked systems, the Westinghouse spokesman said.

The WDPF system, released in late 1981 and based on the Intel Corp. 16-bit 8086 microprocessor, was originally used for process control in industries such as petrochemicals and food processing. The system was later enhanced with pro-

See **LINK** page 72

Apollo cuts system prices

Enhanced server processor unveiled

CHELMSFORD, Mass. — Apollo Computer, Inc. announced price cuts of up to 38% on its 32-bit DN300 and DN320 workstations and related 34M-byte and 70M-byte disk subsystems.

The low-end DN300 with 1M byte of main memory, the company's Domain local-area network interface, virtual memory and system software was reduced 38% to $9,900, the company said.

The DN320, standard with floating-point hardware, was reduced 21% to $18,900.

Apollo also announced the DSP80A server processor, an enhanced version of the company's DSP80. The DSP80A features a memory expansion from 1M byte to 3M bytes, an enhanced cooling system and improved mechanics for easier maintenance, the company said.

The DSP80A, which has two RS-232 I/O ports and a five-slot Intel Corp. Multibus card cage, is said to allow user nodes to off-load peripheral and communications functions.

The price for the DSP80A with 1M byte of main memory, two RS-232C serial ports, a subset of the Aegis operating system and a five-slot Multibus card cage is $12,000, according to the company. The price with 3M bytes of main memory is $21,000.

Integration processor standard

The DN300 and DN320 come standard with a 32-bit very large-scale integration processor, a virtual memory management unit, an integrated 17-in. 1,024- by 800-pixel resolution graphics display and detachable keyboard and an interface to the Apollo's 12M-bit/sec token-passing ring local-area network called Domain.

Apollo's operating system Aegis is also provided, and the company's version of AT&T's Unix, called AUX, is available as an option.

A 34M-byte Winchester disk drive that previously cost $10,500 now costs $10,000, and the 70M-byte Winchester disk, formerly $12,800, now costs $11,000, the company said.

Other price reductions announced by

See **CUTS** page 72

Hitachi's 1M-bit memory chip rounds 'final turn,' enters development stage

By Charles Babcock
CW New York Bureau

NEW YORK — Representatives of Hitachi Ltd. of Japan said they are "entering the final turn before the home stretch" in the race to build a 1M-bit memory chip. Spokesmen for the company also revealed that, unlike IBM and AT&T, Hitachi is continuing to conduct research on Josephson Junctions and other cryogenic research.

Hisashi Horikoshi, Hitachi's director of circuit research, said the firm's Josephson Junction project is still in the basic research stage with no specific applications. Hitachi is conducting the research with an eye toward demands in 1990 for a computer capable of 50-picosec cycle times. A rough Josephson logic gate array built by Hitachi had a cycle time of 5.6 picosec, he said.

Masaharu Kubo, Hitachi's chief researcher, said Hitachi was "entering the final turn" in designing a 1M-bit, dynamic random-access memory chip, capable of storing the text of eight newspaper pages.

Hitachi said it will use a "corrugated trench structure" that provides a large, stored-signal charge capacity in the silicon substrate while taking up little of the chip surface. The project has been transferred from its research phase to development

See **CHIP** page 72

- International Imaging Systems, Inc. unveiled the Model 6500 and 6700 digital image processors/**68**
- Megatek Corp. enhanced its Whizzard 1600 line of engineering terminals with an Intel Corp. 80186 microprocessor/**68**

INSIDE

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Printers/Plotters/**69**

SHOP TALK
William S. Krupka

Computer hygiene vital

Computer hygiene is the regular — daily or weekly — care and preventive maintenance of computer hardware. It includes cleaning CRT screens, keyboards, floppy disk drives, computer casings (known as the skin) and the exposed interior of the printer, its plastic shield or sound cover and platen.

The direct result of good computer hygiene is peak performance of the equipment, along with higher morale on the part of the operator. Without a scheduled cleaning program, users may be leaving equipment vulnerable to costly repairs and downtime.

If you were to ask most computer operators how they

See **CLEAN** page 74

Krupka is president of Computer Care, a vendor of computer cleaning products in Laurel, Md.

HARD TALK/TOM HENKEL

Do IBM rumors breed publicity?

IBM is by far the most secretive company in the computer business. It flatly refuses to discuss details of unannounced products or comment on potential alterations in its business plan. But in spite of that secretiveness, there appears to be no end to the rumors about what IBM will do next.

Clearly, IBM's dominance in the computer business makes it an ideal target for rumors. Almost everyone is interested in hearing predictions of what IBM will do next — even if those predictions sometimes contain painfully few facts.

But since some of the rumors about IBM eventually turn out to be accurate, it is clear that somewhere along the line, some well-informed sources within IBM must be talking out of turn. In fact, some people believe that IBM, through its long-standing policy of not officially commenting on speculative issues, may have stumbled onto one of the best marketing tools ever invented — intrigue.

For example, by intentionally dropping a few well-timed, unofficial hints about its future products and directions, IBM can create an aura of mystery and anticipation about its new products that tends to produce more publicity than any official explanation could ever muster.

Since the trade press is all too willing to listen to — and sometimes publish — the speculations and inside information gathered by industry analysts, IBM can get huge amounts of free publicity before it actually announces a product. Even leaving out of account the purely speculative articles, IBM often benefits from free publicity. For example, asking users how they are planning to deal with an upcoming IBM product indirectly tends to hype the new product. This scenario has happened at least five times in

See **RUMORS** page 74

Image processors unveiled

Models 6500, 6700 aimed at analysis marts

MILPITAS, Calif. — International Imaging Systems, Inc. has announced the Model 6500 and Model 6700 digital image processors for medical, industrial, military and resource analysis markets.

The Model 6500 provides either 1,280- by 1,024-pixel interlaced or 640- by 512-pixel noninterlaced display supporting true color, pseudocolor or up to three simultaneously displayed monochrome images. Three pipelines support radiometric scaling and interactive manipulations in real time at 30 frame/sec. Image array arithmetic and iterative/recursive operations are accomplished at 7.5 frame/sec for 1,280- by 1,024-pixel resolution.

The Model 6500's arithmetic processor is said to provide an architecture that can be used for common image array arithmetic/logical operations and spatial filtering operations. Up to 10 independent graphics planes are provided with independent zoom and scroll capabilities, at up to 16 times magnification.

The 6500 uses a Motorola, Inc. 68000 microprocessor to support device initialization, display control, man-machine interface control and character/vector generation, the company said. The price for the Model 6500 is $39,000, the company said.

The Model 6700 is a monochrome or pseudocolor processor for applications requiring data acquisition and simultaneous real-time processing capabilities. The 6700 features a 1,024- by 1,024-pixel display and performs image array processing on 8-, 12- or 16-bit imagery. It also has a 16-bit, bidirectional port, the vendor said.

Prices for the Model 6700 begin at $49,000, the vendor said. Deliveries of both models are scheduled to begin in the first quarter of 1985.

More information is available from International Imaging Systems at 1500 Buckeye Drive, Milpitas, Calif. 95035.

'Blumenkraft, here, has come up with a radical new theory on funding.'

Computerworld/Mexico talks to computer people south of the border.

There are currently 15,000 installed computers on 12,000 sites in Mexico. These include mainframes, medium and small computers as well as personal computers. Experts forecast the sale of small, medium and large computers to grow at an average annual increase of 20% during the 1980s, despite Mexico's current economic problems. Minicomputers will be in great demand since they are small, affordable and efficient. U.S. manufacturers have maintained a 80% market share for the past three years with sales of over $182 million. *Computerworld/Mexico* can bring your message to 10,000 key-decision makers in the Mexican computer community. Published on alternate Mondays, *Computerworld/Mexico* covers all the latest developments in hardware, software and terminals in addition to data processing and computer related subjects. Its goal is to provide useful information to data processing professionals throughout Mexico and Central America.

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Megatek VDTs get upgrade

SAN DIEGO — Megatek Corp. has announced that its Whizzard 1600 series of engineering terminals has been enhanced with Intel Corp. 80186 microprocessors, upgraded from the Intel 8085s.

The 1600 series will continue to use an additional 8085 processor for keyboard operations and peripherals functions.

Megatek also announced that it will sell and support Versatec, Inc. V-80 electrostatic printers, featuring 200 dot/in. resolution and 8.5 sec/page output speed. The price for the printer option is $7,200.

Whizzard 1600 terminals in the field can be upgraded at a cost of $1,000 per terminal, the company said.

The 1600 series features two-dimensional or three-dimensional interactive graphics. The color 1650 model features a 19-in. color raster monitor, 640- by 480-pixel resolution and simultaneous display of 16 colors from a palette of 4,096, the company said.

The monochrome 1645 offers the same functions as the 1650, with 1,280- by 960-pixel resolution, the company said.

The price for the 1645 is $8,900, and the price for the 1650 is $9,900, the company said.

More information is available from Megatek at 9645 Scranton Road, San Diego, Calif. 92121.

TURNKEY SYSTEMS

FRANKEL ENGINEERING LABORATORIES, INC.

FEL Mill

Frankel Engineering Laboratories, Inc. has announced FEL Mill for generating milling machine programs.

FEL Mill's software reportedly is an enhanced version of the FEL Milling Machine applications software originally developed for the Hewlett-Packard Co. HP 3000 superminicomputer. The hardware consists of an HP 150 touch-screen microcomputer with a printer, an optional plotter and an optional tape punch. The turnkey system lets programs be generated off-line so milling machinery is not tied up for programming.

Part geometry reportedly can be defined with FEL Mill through simple specifications and then a segment of geometry can be reused. On screen, part geometry can reportedly be scaled, inverted, reflected, rotated, translated or repeated in pattern. FEL Mill displays prompts, menus and messages and has library and editing capabilities, the vendor said.

FEL Mill is priced at $9,950.

Frankel Engineering Laboratories, P.O. Box 501, 125 S. Fifth St., Reading, Pa. 19602.

TERMINALS

THOMAS ENGINEERING CO.

Tempest terminals

Thomas Engineering Co. has announced three Honeywell, Inc.-compatible terminals that conform to government Tempest security standards for protection against radio frequency interference.

The TE-780x is an Ascii terminal with Honeywell 7814 emulation; the TE-780x-S is the Visual Information Projection synchronous version of the 780x; and the TE-780x-V is said to combine the Honeywell 7814, Digital Equipment Corp. VT100 and Ansi standard emulation in one terminal.

Thomas Engineering terminals, based on the Zilog, Inc. Z80 8-bit microprocessor, feature 12 user-programmable function keys, full editing, 11 logical attributes and five visual capabilities.

Each terminal costs $6,495.

Thomas Engineering, 2440 Stanwell Drive, Concord, Calif. 94520.

See **UNIT** page 69

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SYSTEMS & PERIPHERALS

UNIT from page 68

DECISION DATA COMPUTER CORP.
Amber option for 3761 workstation

Decision Data Computer Corp. has added a no-charge amber screen option to its 3761 CRT workstations.

Intended for use with IBM System/ 34, System/36 and System/38, the workstation had previously been available only with green-phosphor screens. The workstation costs $1,820, the vendor said.

Decision Data, 100 Witmer Road, Horsham, Pa. 19044.

WYSE TECHNOLOGY, INC.
WY-85 terminal

Wyse Technology, Inc. has announced the WY-85 terminal, said to be compatible with Digital Equipment Corp.'s VT220 CRT terminal. The unit offers 132 columns on a 14-in. screen with tilt-and-swivel features.

The WY-85 is also compatible with the DEC VT100 and VT52 terminals and conforms to the Ansi X3.64 standard. Users of DEC PDP-11 and VAX-11 series minicomputers can plug in WY-85 terminals without changes, according to the company.

The product is scheduled to be available in February. The price for the WY-85 is $799, the vendor said.

Wyse Technology, 3040 N. First St., San Jose, Calif. 95134.

PRINTERS/ PLOTTERS/ PERIPHERALS

DECISION DATA COMPUTER CORP.
6706 printer

Decision Data Computer Corp. has introduced a dot matrix printer said to be designed for data processing, correspondence-quality reproduction and graphics.

The 6706 is said to feature color-coded membrane key on the operator control panel, a four-character status display, microprocessor electronics and plug-compatibility with IBM's System/34, System/36 and System/38 small business computers. It is said to provide throughputs of 600 line/min in its data processing mode and 280 line/min for correspondence-quality printing.

Compatibility with System/34, System/36 and System/38 software reportedly enables the 6706 to reproduce graphics using application programs.

The 6706 costs $14,400.

Decision Data, 100 Wilmer Road, Horsham, Pa. 19044.

VERSATEC, INC.
7200 series plotter upgrade

Versatec, Inc. has announced an upgrade feature said to increase speed and improve the resolution of the firm's 7200 series plotters from 200 to 400 point/in.

All higher resolution Versatec 7400 series models are said to offer faster maximum-rated paper speed, the company said.

Speed has been increased for Models 7422 and 7424 to 1.0 in./sec, for 7436 to 0.8 in./sec and for 7444 to 0.6 in./sec. Previous rated speed for 400 point/in. models was 0.6 in./sec for 7422 and 7424 and 0.4 in./sec for 7436 and 7444.

The cost to upgrade any 200 point/in. Versatec 7200 plotter to 400 point/in. is $10,000, plus an initial installation cost of $600, the company said.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

See **PRINT** page 72

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DIGITAL DISPLAYS THE TERMINALS BEST ENGINEERED FOR BUSINESS.

Before you make any investment in business graphics terminals, it really pays to investigate what you'll be using them for.

If you're like most businesses, your terminals will be used approximately 70% of the time for generating text and numbers. And only around 30% of the time for strictly graphics purposes. The October 1983 *Infosystems* article, "How to Buy Graphics Displays," coauthored by Jim Warner, CEO of Precision Visuals, Inc.,® states, "While it may be true that one picture (chart, graph) is worth a thousand words, there will always be the need for words, thousands of words, in the day-to-day activity of the office. Special graphics-only devices can have limited value in a general office environment."

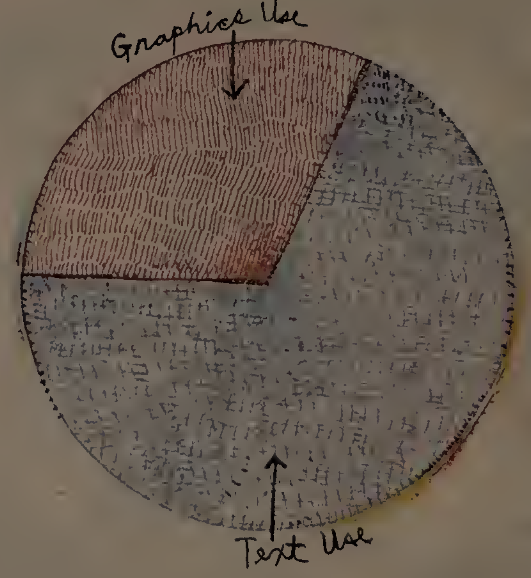
At Digital, the first step in engineering every product we make involves a thorough analysis of who will use it, what it will be used for and which features will help make people more productive in their jobs.

That's been true of every terminal we've designed and helps explain their widespread acceptance and popularity.

And you'll find it's equally true of Digital's latest entries, the VT240™ and VT241™ terminals.

ENGINEERED BEST FOR WHAT YOU NEED MOST.

As the newest members of Digital's family of terminals, the VT240, a conversational text and graphics terminal, and the VT241, with the added dimension of color, continue the tradition of engineering excellence for performance. They offer full VT100™ compatibility to take advantage of a host of offerings already developed. And to meet the needs of the business environment, you'll find a set of standard text features that are either unavailable on other terminals or may have to be purchased at an additional cost.



These features include bidirectional smooth scrolling, split screen, a choice of 80 or 132 columns per line and a double width/double height format. A highly legible 8 by 10 dot matrix character font displays true ascenders and descenders for exceptional crispness and legibility. If certain information needs to be highlighted, you can select from a combination of bold print, blinking and underlining in either normal or reverse video. For your added convenience, there's even a built-in printer port for printing hard copy.

Both the VT240 and VT241 terminals give you the option of erasing selected character positions on the screen for more efficient communications and increased productivity. For those applications that require data to be entered by filling in the blanks of a form, once the data has been accepted by the host, the filled-in information – and only that – can be erased by means of a single command. The form itself remains up on the screen and is ready to accept the next data entry sequence.

Beyond this remarkable range of text capabilities, the VT240 and VT241 clearly answer your graphics needs as well.

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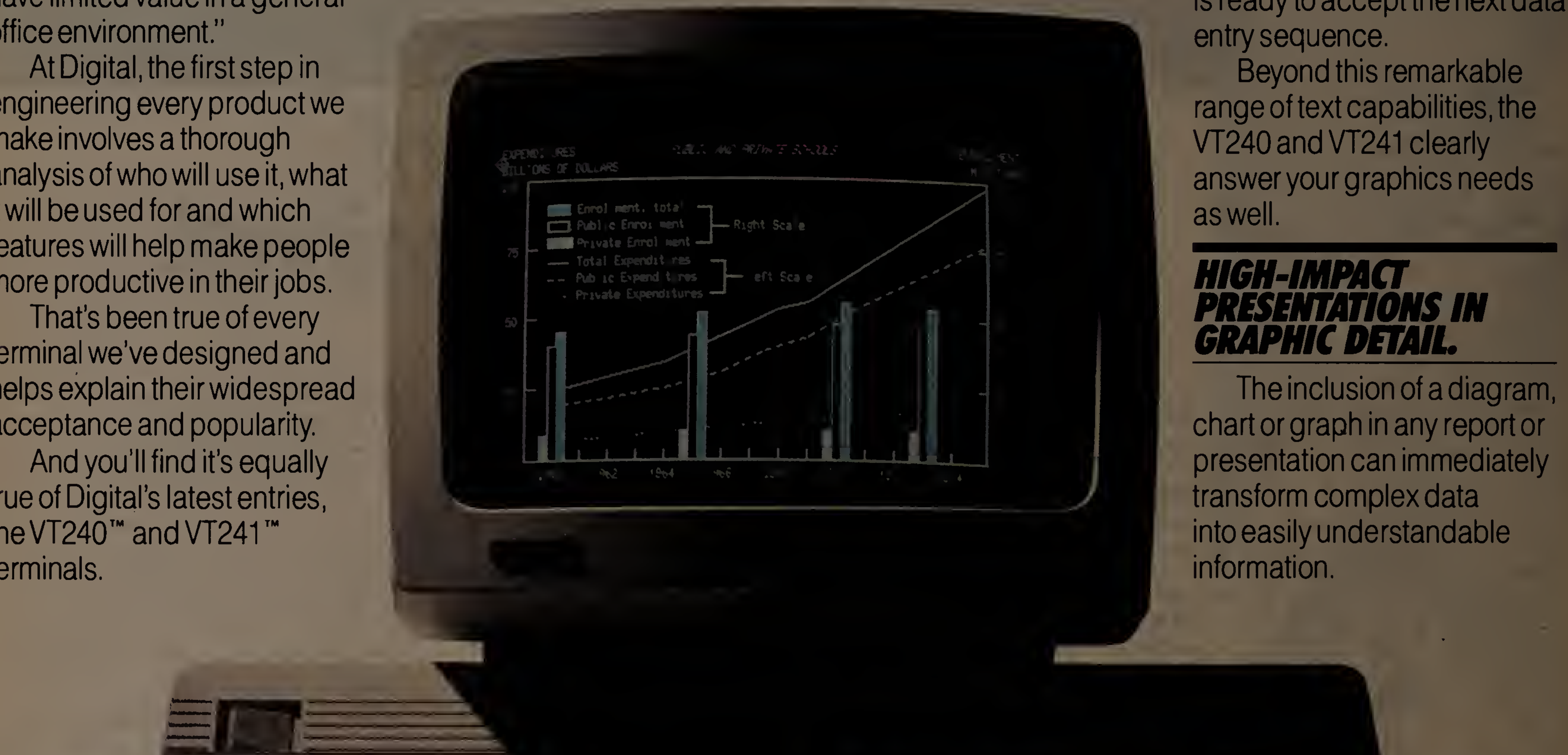

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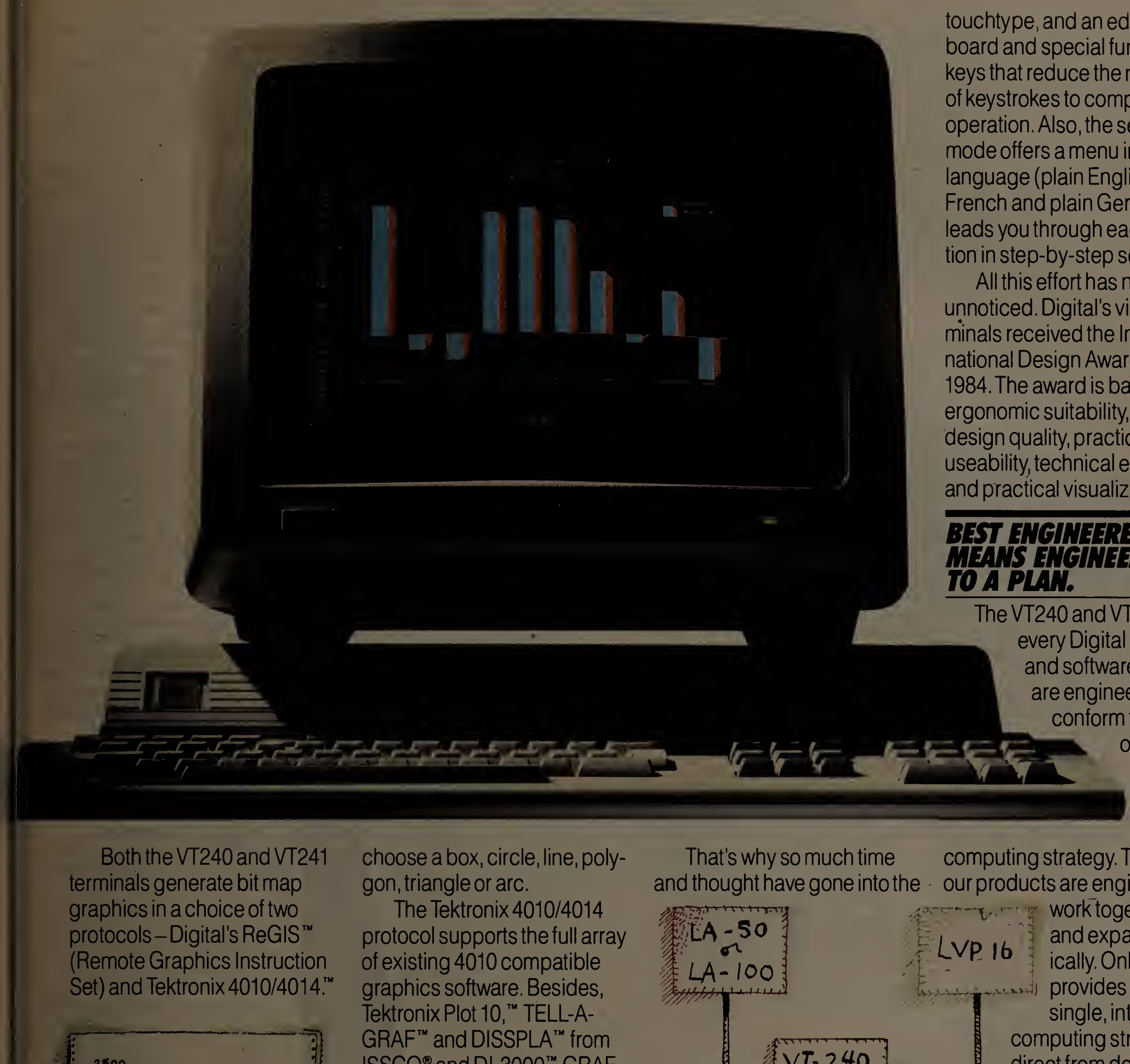

touchtype, and an editing keyboard and special function keys that reduce the number of keystrokes to complete an operation. Also, the set-up mode offers a menu in plain language (plain English, plain French and plain German) that leads you through each operation in step-by-step sequence.

All this effort has not gone unnoticed. Digital's video terminals received the International Design Award in 1984. The award is based on ergonomic suitability, safety, design quality, practical useability, technical excellence and practical visualization.

BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

The VT240 and VT241, like every Digital hardware and software product, are engineered to conform to an overall computing strategy. This means our products are engineered to work together easily and expand economically. Only Digital provides you with a single, integrated computing strategy direct from desktop to data center.

For more information and the name of the Authorized Terminals Distributor or Digital Representative near you, call 1-800-DIGITAL, extension 700. Or write Digital Equipment Corporation, 2 Mount Royal Avenue, UP01-5, Marlboro, MA 01752.

Both the VT240 and VT241 terminals generate bit map graphics in a choice of two protocols – Digital's ReGIS™ (Remote Graphics Instruction Set) and Tektronix 4010/4014.™

ReGIS lets you create and store business graphics as simply as producing ASCII text. With VAX-11 DECgraph™ and VAX-11 DECslide™ software, even a novice can prepare graphs and charts and turn them into slides. Self-explanatory icons let you choose a box, circle, line, polygon, triangle or arc.

The Tektronix 4010/4014 protocol supports the full array of existing 4010 compatible graphics software. Besides, Tektronix Plot 10,™ TELL-A-GRAF™ and DISSPLA™ from ISSCO® and DI-3000,™ GRAFMAKER™ and GRAFMASTER™ from Precision Visuals are also supported.

When you're using third party software, Digital provides you with the total hardware/software solution: video terminals, hard copy with the LVP16™ Pen Plotter and the VAX™ computer.

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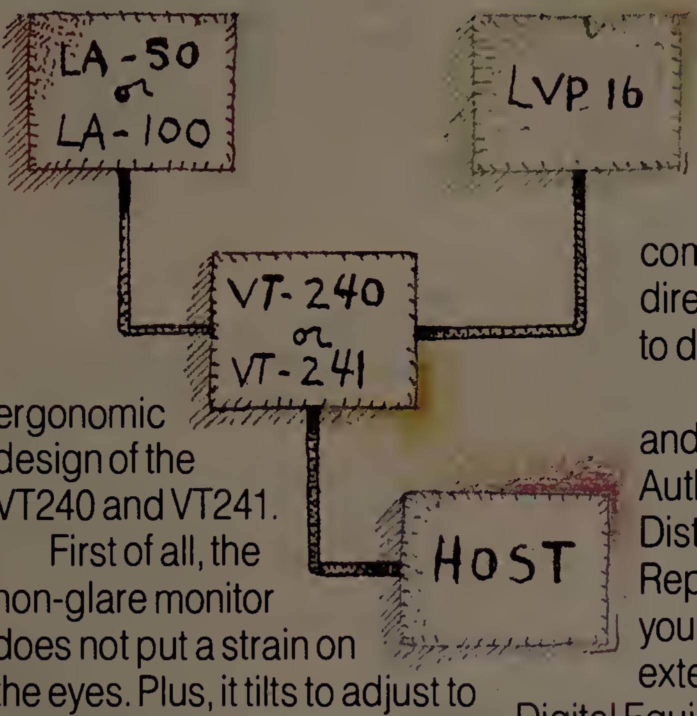
Your people have to spend long hours in front of a terminal. It stands to reason the easier they are to use, the more productive the results.

That's why so much time and thought have gone into the ergonomic design of the VT240 and VT241.



First of all, the non-glare monitor does not put a strain on the eyes. Plus, it tilts to adjust to the exact viewing angle that's most comfortable to work with. The detachable keyboard is ruggedly constructed, yet light enough to place on your lap. Even the way the keyboard has been arranged boosts productivity.

There's a standard typewriter keypad so you can

THE BEST ENGINEERED COMPUTERS IN THE WORLD

digital™

PRINT

from page 69

GULTON INSTRUMENTS, INC.

Superplot-80

Gulton Instruments, Inc. has announced an 80-col. thermal printer/plotter that uses a linear array thermal print head.

Superplot-80 is said to be designed for computer and instrumentation graphics hard-copy uses in computer-aided design and manufacturing, scientific laboratory use, structural analysis, medical patient monitoring and other applications in which flatbed X-Y plotters traditionally are used.

Superplot-80 reportedly produces graphics at a speed of 71 line/sec and prints near-letter-quality alphanumeric characters at more than 500 char./sec. It is said to feature a 96-char. Ascii set in a variety of fonts and a 32-char. international set.

The unit reportedly includes page-level vector graphics that enable the user to format a graphics display based on coordinates generated by the host system. It has an 8-in.-wide printable field on 8½- by 11-in. thermal chart paper.

According to the vendor, Superplot-80 will be available in February priced at about $2,000.

Gulton Instruments, Gulton Industrial Park, East Greenwich, R.I. 02818.

LINK

from page 67

grammable controllers and now has factory automation capability. The system currently is in use at 110 sites worldwide, 85% of them in the U.S., including a major application in a General Dynamics Corp. defense plant in the U.S., Zabielski said.

The base price for a Westinghouse WDPF system, including a processor using a 16-bit Intel 8086 microprocessor and an engineering or operating console and keyboard but not including the VAX-11 CPU, is $250,000.

More information is available from Westinghouse, Westinghouse Building, Gateway Center, Pittsburgh, Pa. 15222.

CUTS

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Apollo were as follows: The DN300 with 1M byte of main memory is reduced from $15,900 to $9,900. The price for a DN320 with 1M byte of main memory and a 34M-byte Winchester disk drive is $19,900, reduced from $26,400. And the price for the DN300 with 3M bytes of main memory is $18,900, reduced from $25,900.

The DN320 with floating-point hardware, configured with a 1.5M-byte main memory, is reduced from $22,900 to $18,900; with a 3M-byte main memory and a 70M-byte Winchester disk drive, the price is $36,650, reduced from $43,200.

The products are used for low-end mechanical and electronic computer-aided design, computer-aided software engineering, technical documentation and illustration and architectural engineering construction.

The price reductions were made possible by decreased component costs and increased efficiencies within Apollo's manufacturing process, the company said.

Apollo Computer is located at 330 Billerica Road, Chelmsford, Mass. 01824.

CHIP

from page 67

phase, Kubo said.

"We still have several problems to work out before bringing it to production," he said, adding that it is expected to be ready for marketing in late 1986 or early 1987.

IBM has announced that it has built a prototype 1M-bit memory chip, and other U.S. chip makers are known to be working on the project.

Hitachi officials commented on the technology projects at the company's recent Technology '85 exhibit at the World Trade Center in New York.

Hitachi officials said they were manufacturing 10 million 64K-byte memory chips a month, even though demand is expected eventually to shift to the 256K-byte chip that Hitachi now has in production. Hitachi spokesmen would not disclose how many 256K-byte chips they were producing but said the company had sold $2 million worth in December.

Company officials said 75% of Hitachi's semiconductor production was slated for factory use rather than consumer use. Fifty percent of its semiconductor production formerly went into the consumer market.

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CLEAN

from page 67

feel about cleaning their hardware, the standard replies would be: "What's there to clean?" Or, "the service man will do it at the end of the month." Or, "the janitor will do it."

But there are many reasons why it should be the operator who cleans the hardware. For example, the operator is most familiar with the equipment. By following weekly maintenance procedures, the operator can make his job easier and can save his company time and money.

When most people buy a car or a major appliance, the first thing they do is to read the owner's manual. In the case of an automobile, the owner's manual has a section on preventive maintenance, including tire pressure, fluid levels to maintain and specific grades of fluids to be used. Even from an aesthetic point, automobile and appliance manufacturers will recommend specific products to use for cleaning.

Unfortunately, the owner's guides for most computers, printers and related components do not come with procedures for maintaining the equipment, nor do most service technicians take the time to explain to their customers what should be done.

To begin a computer hygiene program, an outline must first be made, listing the components that must be cleaned and the frequency of cleaning, along with the products and procedures that will be used.

After the outline has been designed, it is important to work out a means of communications with all computer operators. Without proper training to convey the purpose and benefits, the program will never succeed.

Communication blitz

Obviously, the larger and more spread-out an organization is, the more difficult it is to communicate with operators the benefits of computer hygiene. To deal with this problem, it is advisable to use as many forms of communications as possible to blitz the users and make them aware that computer hygiene is not only their responsibility, but also company policy.

A monthly newsletter might introduce the program with a feature article, and future newsletters could include a 3-in. by 5-in. section choosing a computer hygiene subject each month, such as, "What would happen if you used water to clean your keyboard?" The explanation would not only give the answer but also take this valuable space to explain what products the company uses to maintain these tools, how and when to use the products and where to procure them.

A company with many satellite offices may use large posters in lunchrooms and rest areas as a form of reminding computer operators to keep the program intact. New-employee orientation is a good time to discuss computer hygiene and its procedures. If a training department is available, computer hygiene can easily be included in the curriculum.

RUMORS

from page 67

the past five years and includes numerous reports of the "E" series (which turned into the 4300 series in 1979), the "H" series (which debuted as the 3081 in 1981), IBM's microcomputer (the Personal Computer that also appeared in 1981), the '"Peanut" (which came to be known as the PCjr in late 1983) and now the Sierra, rumored to be IBM's next line of mainframes.

Why does IBM get such treatment? The standard answer goes back to IBM's dominance in the industry. Since IBM has a stranglehold on much of the computer industry and because IBM's actions tend to influence the industry as a whole, it follows that users are more eager to hear about the escapades of IBM than any other company.

While many companies would kill for the exposure that IBM so regularly receives, the publicity is not without disadvantages. Widespread rumors of pending IBM product announcements tend to stagnate the marketability for current products. A case in point is all the hubbub that preceeded the PCjr announcement. Many faithful IBM users held off on ordering IBM microcomputers for fear that the Peanut would replace the original Personal Computer line.

Currently, IBM seems to be having the same problem with its high-end mainframe line. With so many rumors flying about the Sierra line, many users plan to wait until IBM formally tips its hand on this new line of mainframes before they decide to buy a new system. When you consider how much revenue each mainframe sale generates for IBM, it is clear that a continued trend toward such deferrals could hurt even Big Blue.

So poor IBM, right? It is hard to feel sorry for the most successful corporation in history if it experiences some sagging sales as a result of hype over its own future products. But there may be a truly serious problem brewing here. Since IBM is announcing products at a much faster pace than any time in its history, the firm might wind up being its own toughest competitor.

For example, as soon as the latest IBM product hits the market, the IBM speculators will start talking about how much better its successors will be. This, in turn, could cause some users to delay purchasing hardware in lieu of the next line of products.

Obviously, users cannot wait forever to get the absolutely best product from IBM, but the speculation surrounding new IBM products could wind up having an adverse impact on some IBM sales.

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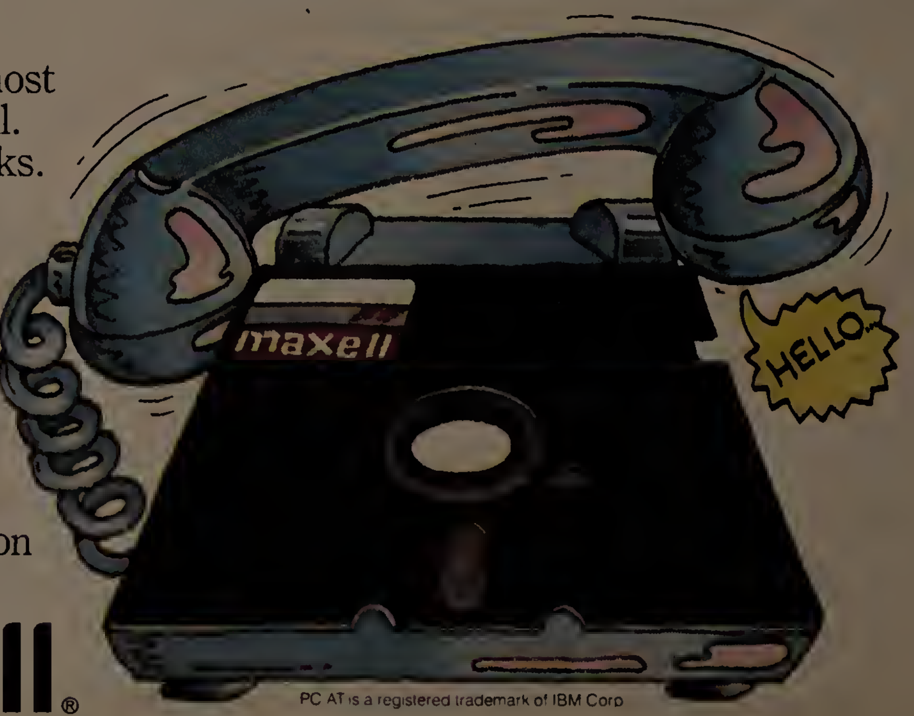

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MICROCOMPUTERS

AT&T desktop coming soon: FCC filings

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — AT&T Technologies plans to introduce a desktop voice and data microcomputer in early 1985, according to filings at the Federal Communications Commission. Manufactured by Convergent Technologies, Inc. of Santa Clara, Calif., the micro, dubbed the Safari 4 or PC 7300, will use AT&T's Unix operating system "in a friendly, easy-to-use environment," the documents said.

The basic specifications of the system, outlined in filings submitted to the FCC for technical approval, reveal a desktop unit built around the Motorola, Inc. 68010 microprocessor that will have 512K bytes of random-access memory, 10M bytes of hard-disk storage capacity (expandable to 20M bytes) and a single 500K-byte, double-sided floppy disk drive.

According to the documents filed at the FCC, the PC 7300 is aimed at the office environment and will be able to link up with a variety of existing proprietary communications systems, including wideband (coaxial cable) premises networks, small local-area networks, IBM's Systems Network Architecture, public packet switching networks and AT&T's Merlin private branch exchange system.

However, the documents indicate that the principal feature of the system will be the combined voice and data communications capacity of the PC 7300, offering standardized dialing services, electronic mail, directory service, automatic calling, redialing, call management, simultaneous data transfer during audio calls and data transfer rates of up to 19.2K bit/sec. Data transfer capabilities will be available between synchronous and asynchronous terminals running under Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M operating systems, as well as Unix hosts, IBM hosts and other asynchronous

See **AT&T** page 86

Multimate gets additions

Spacing, merging capabilities highlight upgrades of popular word processing program for IBM micro

EAST HARTFORD, Conn. — Multimate International Corp. has enhanced its Multimate word processing program for the IBM Personal Computer. Key enhancements consist of proportional spacing facilities and improved merging capabilities, the vendor said.

Release 3.30 of Multimate reportedly can print documents that incorporate proportional spacing and microjustification. This option was added for the increasing number of printers that support proportional spacing and extended character sets, the vendor said.

The merge facilities incorporate specific pages in list documents and merge lists created by other programs, according to Multimate. The program reportedly works with files from IBM Displaywriter's Document Content Architecture as well as Ascii and Data Interchange Format files.

The new release includes additional document protection options, including one that creates an automatic backup copy of any document that a user edits, the supplier said. The package is said to allow a user to create and edit documents on more than one subdirectory on a disk, which is useful for users with hard-disk storage.

In addition, users with color or graphics monitors are now able to change screen display colors and shadings.

Multimate runs on an IBM Personal Computer with IBM's PC-DOS 1.1 or higher and 256K bytes of random-access memory.

The package costs $495. Current users can upgrade to the new release for $50.

Multimate International is located at 52 Oakland Ave. N., East Hartford, Conn. 06108.

Tandy updates laptop system

Model 200 adds memory, 16-line tilting LCD screen

FORT WORTH, Texas — Tandy Corp. has announced the TRS-80 Model 200, an upgraded version of the company's TRS-80 Model 100 portable computer.

The Model 200 features 24K bytes of random-access memory (RAM), which can be expanded to 96K bytes; 72K bytes of read-only memory (ROM), which can be increased to 104K bytes; and a 16-line by 40-char. tilting LCD, the vendor said.

The laptop computer also reportedly includes a 300 bit/sec modem, cassette interface, parallel printer interface, RS-232C interface and eight function keys.

Tandy Corp.'s TRS-80 Model 200

The 72K bytes of ROM include Microsoft Corp.'s Basic language and Multiplan spreadsheet program, a word processing program, a telecommunications program, an appointment and filing program and an address and telephone file program, Tandy said. A calculator is available with each

See **LAPTOP** page 86

- Ashton-Tate's Framework and Dunsplus' Dunsplus packages emerged as winners in a comprehensive Software Digest, Inc. study of integrated productivity software/**76**
- Information Builders, Inc. offers PC/Focus fourth-generation software for the IBM Personal Computer AT/**77**

INSIDE

Software/**77**

Avoiding bells and whistles

SMALL TALK
Eric Bender
CW Senior Editor

If designers of executive workstations ignored costs and integration difficulties and just grabbed everything from the continuing parade of "new-technology" desktop products, they could make Rube Goldberg proud.

Beginning with a powerful desktop engine with a lot of internal memory and storage, the menu of potential enhancements is almost endless.

The ability to run most popular IBM software probably is a prerequisite this year, so an Intel Corp. processor would be the starting point, but this does not preclude adding a coprocessor to run all those AT&T Unix applications forever lurking just around the corner. Certainly a multitasking operating system running with Microsoft Corp.'s MS-DOS might come in handy on occasion, and sufficient power might be available with the Intel 80286. If not, a Motorola, Inc. 68000 or some true 32-bit processor could be added.

Next is the user interface, and here the horizons really open up: touch screens, graphics tablets, the mouse and other input devices, along with a wealth of pop-up software and operating environments such as IBM's Topview or Digital Research, Inc.'s Graphics Environment Manager. Then there's voice recognition, which surely can do a few odd jobs around the office even

See **DESIGN** page 84

Dedicated multifunction server to support micro local-area nets

MOUNTAIN VIEW, Calif. — 3Com Corp. today will introduce "the first high-performance system designed exclusively to be a multifunction server for personal computer local-area networks at a microcomputer price," said William Krause, the firm's president.

Running 3Com's Etherseries network software, the $7,495 3Server will reportedly provide disk sharing, printing, communications and backup functions in one system.

The 3Server will support up to 50 network users in personal productivity applications such as spreadsheets and electronic mail and up to 10 users in transaction-intensive multiuser applications such as data base and accounting, said Douglas Pollack, 3Com's server marketing manager.

Built around an Intel Corp. 80186 microprocessor, operating at 8 MHz, and an 82586 Ethernet controller, the 3Server reportedly features a 512K-byte internal memory, expandable to 896K bytes; two built-in Small Computer Systems Interface ports; a parallel port; and a serial port.

A 36M-byte hard disk drive is standard. Users can add up to six external disk drive modules, priced at $3,995 each, extending total disk storage to more than 250M bytes, the company said.

An optional 60M-byte tape unit, able to back up multiple servers on a network, is priced at $2,995.

Supersedes the AP Server

The 3Server will supersede 3Com's current specialized network server, the AP Server, but the company will continue to support the IBM Personal Computer and Personal Computer AT

See **SERVER** page 82

Framework, Dunsplus top study of integrated packages

WYNNEWOOD, Pa. — Framework and Dunsplus tied for first place in exhaustive tests of integrated productivity programs concluded late last month by Software Digest, Inc.

The two packages, from Ashton-Tate in Culver City, Calif., and Dunsplus in Wilton, Conn., each received an overall score of 7.0 on a scale of 1 to 10, acccording to a report published last month in "Software Digest Ratings Newsletter."

The study showed that "integrated packages still have a way to go to satisfy the typical user," commented chairman Joseph Segel.

He noted that in earlier tests, Lotus Development Corp.'s 1-2-3 and several word processing packages scored well over 8.0.

"The high rating of Dunsplus, which does not feature common commands for word processing and spreadsheet functions, suggests that the quality of the component parts of the integrated package is more important than standardization of commands, although users would naturally like to have both," the report said. Dunsplus is based on 1-2-3 and Multimate International, Inc.'s Multimate.

Covering 15 packages for the IBM Personal Computer, the study involved six experts and a panel of 12 "typical users," took up more than 5,000 hours of testing and generated more than 40,000 numerical scores, according to Software Digest. Ease of learning, ease of use, error handling, performance and versatility were all examined in depth, according to Segel, who estimated that the firm spent more than $100,000 on the research.

In other results, Enable, from The Software Group in Ballston, N.Y., scored 6.8 overall. Symphony, from Lotus in Cambridge, Mass., and Smart Software System, from Innovative Software, Inc. in Overland Park, Kan., were each rated at 6.6.

Following these programs were, in order, Integrated 7 from Mosaic Software, Inc. of Cambridge, Mass.; Electric Desk from Alpha Software, Inc. of Burlington, Mass.; Goldengate from Cullinet Software, Inc. in Westwood, Mass.; Open Access from Software Products International, Inc. of San Diego; Aura from Softrend, Inc. in Salem, N.H.; Series One Plus from Executec Corp. in Richardson, Texas; Decision Manager from Peachtree Software, Inc. of Atlanta; and Corporate MBA from Context Management Systems, Inc. in Torrance, Calif.

Framework and Integrated 7 tied for first place in ease of learning, and Framework was found easiest to use. Enable was judged best in both performance and versatility. Framework and Dunsplus tied for best error handling, the report found.

Enable and Framework offered the top-rated word processing functionality, according to Software Digest. Symphony and Dunsplus tied for spreadsheet capabilities.

Drawbacks

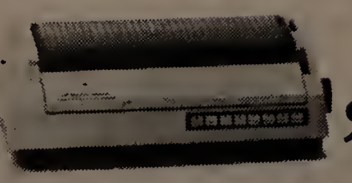
Among common drawbacks highlighted by the study, none of the programs did well in data base functions, Software Digest said. In addition, "six of the programs don't perform mail merge," the report pointed out.

The report also showed variations in performance on given tasks. Among disk-based data base programs, the time needed to add a 20-char. text field to an existing data base ran from 0.8 sec (Goldengate) to 2,474.1 sec (Decision Manager).

In another example, the time to save an eight-page document ranged from 2.6 seconds (Open Access) to 53 seconds (Aura). One spreadsheet recalculation task took between 6.5 seconds (Dunsplus) and 123.6 seconds (Corporate MBA).

A copy of the "Software Digest Ratings Newsletter" costs $29. More information is available from Software Digest, Wynnewood, Pa. 19096.

From



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Nobody puts ideas on paper so many ways.

If you're using your printer with a personal computer, you probably need one that can handle a variety of functions.

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The pint-sized Dataproducts printer in the picture costs about as much as one good software package.

It prints spreadsheets, graphics and illustrations, labels, multi-part forms—even letters that look like they were typed.

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Dataproducts computer printers.

Micro-based aid targets disaster recovery plans

WOODBRIDGE, Va. — Advanced Information Management, Inc. has introduced AIM/Plan, a microcomputer-based planning tool for disaster recovery that initially runs on IBM, Wang Laboratories, Inc. and Fortune Systems Corp. personal computers with word processing capability.

The software reportedly provides the framework for a complete set of procedures for backup and recovery of business and data processing operations under emergency conditions.

The modular, formatted tool provides specific instructions that describe the tasks to be accomplished and provides guidelines for tailoring the plan to the client organization, the vendor said.

The multidiskette AIM/Plan is available for a one-time license fee of $3,900 and may be reviewed prior to licensing.

More information is available from Advanced Information Management, located at 1988 Opitz Blvd., Woodbridge, Va. 22191.

SOFTWARE

HANDLE TECHNOLOGIES
Handle Office Automation series

Handle Technologies has introduced its Handle Office Automation series of software for personal computers based on the Intel Corp. 80286 microprocessor and running Microsoft Corp.'s Xenix 3.0 multiuser operating system.

The software series reportedly consists of Handle Writer/Spell, a word processor with integrated spelling checker; Handle Writer/Spell/Calc, which integrates the Handle Calc spreadsheet; Handle Calc; Handle Writer/Spell/List, which integrates a list processor; and Handle Business Graphics with Handle Calc, a spreadsheet and graphics package.

The Handle applications reportedly all operate in multiuser or networked configurations, with file security. The user is said to be insulated from Xenix via a function key-driven common user interface.

The applications are priced as follows: Handle Writer/Spell, $395; Handle Writer/Spell/Calc, $575; Handle Calc, $395; Handle Writer/Spell/List, $545; and Business Graphics with Handle Calc, $445.

Handle Technologies, 850 N. Lake Blvd., P.O. Box 1913, Tahoe City, Calif. 95730.

ELECTRONIC ARTS
Get Organized! version

Electronic Arts has announced a version of the Get Organized! word processor for the IBM Personal Computer AT and PCjr.

Get Organized! reportedly incorporates a word processor with six other software tools: an address book with mail merge feature, a telecommunications manager with autodial capacity, an index filing system, a calendar, a calculator and a notepad.

The package is also said to include $200 worth of coupons for such telecommunications services as MCI Communications Corp.'s MCI Mail and Dow Jones & Co.'s Dow Jones News & Retrieval Service.

Information entered into Get Organized! can be called up by any of the six applications tools, Electronic Arts said. Menus, with commands in common, reportedly allow users to work with each program in a similar fashion.

The package also offers multiple windowing capability that lets users specify the size, shape, position and color of each window, according to the vendor. Editing tools reportedly permit users to cut and paste between applications.

Get Organized! for the PCjr. and Personal Computer AT is priced at $199.

Electronic Arts, 2755 Campus Drive, San Mateo, Calif. 94403.

FOUR-PHASE SYSTEMS, INC.
RM/Cobol for Series 2000

Four-Phase Systems, Inc. has announced that Ryan-McFarland Corp.'s RM/Cobol compiler is now available for use with the company's Series 2000 family of desktop computers running under a virtual memory version of AT&T's Unix System V operating system.

According to a spokesman, the RM/Cobol compiler can be used to develop software for both single- and multiuser business applications, and it gives Series 2000 users access to more than 750 business applications packages.

An RM/Cobol compiler license for Four-Phase Systems' Series 2000 desktop computers costs $850, and a one-time license for end-user locations costs $250.

Four-Phase Systems, 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

INTERFACE TECHNOLOGIES CORP.
M2SDS

Interface Technologies Corp. has introduced its Modula-2 Software Development System (M2SDS) for the IBM Personal Computer, Personal Computer XT and AT.

Continued on page 78

PC/Focus version introduced for IBM Personal Computer AT

NEW YORK — A version of the PC/Focus fourth-generation language and data base management system (DBMS) for the IBM Personal Computer AT has been introduced by Information Builders, Inc.

The new version of PC/Focus reportedly contains full screen facilities for data base management, transaction processing, reporting and ad hoc requests and other tasks. The Personal Computer AT will run PC/Focus with two to three times the speed of the IBM Personal Computer XT, Information Builders said.

PC/Focus' report writer includes language extensions that permit users to create graphics, the vendor said.

The package also is said to include interfaces to mainframe files stored under such mainframe DBMS as IBM's IMS, Cullinet Software, Inc.'s IDMS, Cincom Systems, Inc.'s Total and Computer Corp. of America's Model 204. Interfaces to files under IBM's Qsam, Vsam and Isam are also provided, as is the capacity to relationally join files.

The program costs $1,595, the vendor said.

Information Builders is located at 1250 Broadway, New York, N.Y. 10001.

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DATASTREAM

Continued from page 77

The M2SDS software reportedly permits programmers to use the Modula-2 language to write and compile programs into reliable code. M2SDS reportedly contains a syntax-directed editor that reduces programming statements to a single keystroke. The software also is said to offer background compilation.

The M2SDS software reportedly offers a structured environment for software development, corrects for programming errors and provides online Help functions.

M2SDS is priced at $249.

Interface Technologies, Suite 200, 3336 Richmond, Houston, Texas 77098.

VENTURE SOFTWARE
Bottomline Tax

Venture Software has introduced its Bottomline Tax software for tax planning, preparation, analysis and forecasting on personal computers under Microsoft Corp.'s MS-DOS or Digital Research, Inc.'s CP/M operating systems.

Bottomline Tax reportedly is a menu-driven program consisting of 12 categories that prompt the user through data entry, tax preparation and planning. Users are lead through a complete Internal Revenue Service Form 1040, according to the vendor. The package is said to figure the form's Schedules A through G, SE, W, R and R&P and to print schedules and forms to IRS specifications.

Tax returns reportedly can be developed interactively or in batch mode.

Bottomline Tax is priced at $295.

Venture Software, 16200 Ventura Blvd., Encino, Calif. 91436.

FORTH, INC.
Polyforth II operating system

Forth, Inc. has introduced its Polyforth II operating system for personal computers currently running under Microsoft Corp.'s MS-DOS.

Polyforth II is said to be a multiuser, multitasking operating system designed to support any number of asynchronous processes running concurrently. Under Polyforth II, tasks may have partitions or may execute shared, reentrant routines, Forth said.

Polyforth II also offers the ability to run multiple terminals, unlimited control tasks and concurrent printer operations, according to the vendor.

Polyforth II is priced at two levels. Level 3 includes the operating system, Forth turnkey compiler, assembler, editor, math library, data base support system, utilities and source code for everthing but the nucleus. It is priced at $600. Level 4 includes the Level 3 system, plus full system source code and a compiler for generating read-only memory applications. It is priced at $3,200.

Forth, 2309 Pacific Coast Highway, Hermosa Beach, Calif. 90254.

MANAGEMENT CYBERNETICS, INC.
Proscreen

Management Cybernetics, Inc. has introduced its Proscreen software development tool for the IBM Personal Computer.

The Proscreen, a screen management package, reportedly was designed to facilitate the conversion from Honeywell, Inc. DPS/6 systems to the Personal Computer. It enables a Personal Computer to support functions that resemble the Vforms of the DPS/6, the vendor said.

Proscreen users find interaction with the Personal Computer's screen virtually identical to that on the DPS/6, according to Management Cybernetics.

Proscreen is priced at $795.

Management Cybernetics, P.O. Box 888467, Atlanta, Ga. 30358.

MCTEL, INC.
Post Plus

Mctel, Inc. has introduced its Post Plus software for Tandy Corp. TRS-80 personal computers and personal computers under Digital Research, Inc.'s CP/M 80 operating system. Post Plus reportedly combines word processing with telecommunications capabilities.

Post Plus allows users to retrieve, file and print data, according to the vendor. It is said to include an automatic data capture function that saves messages to the computer's disk, reducing telephone connect charges. Post Plus also reportedly can be programmed to dial an electronic mail service, log on, retrieve mail, send a message and log off, all with one keystroke.

Post Plus is priced at $160.

Mctel, Suite 505, Three Bala Plaza E., Bala Cynwyd, Pa. 19004.

SUNBELT COMPUTER SYSTEMS, INC.
SUNDB86A; SUNDB86M compilers

Sunbelt Computer Systems, Inc. has announced a new release of its Databus compilers for systems running under Microsoft Corp.'s MS-DOS and IBM's PC-DOS operating environments.

The Databus compilers, SUNDB86A and SUNDB86M, according to Sunbelt Computer, are compatible with Datapoint Corp.'s Associative Index Method.

The SUNDB86A is a single-pass Databus compiler; the SUNDB86M is a three-pass Databus compiler, the vendor said.

Both compilers reportedly support the Associative Access Method of the Databus language, which Datapoint developed for use on its minicomputers.

The SUNDB86A is priced at $695, according to the vendor, and the SUNDB86M is priced at $595.

Sunbelt Computer Systems, Suite 111, 5525 E. 51st St., Tulsa, Okla. 74135.

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More optional features such as APL/Text, cursor choices, graphics.

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More productivity from ergonomic keyboards and tiltable screens.

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2178

More flexibility with a modular design, plus tilt and swivel.

More for your money: 3270 functionality at a lower price.

More support and service from a worldwide organization that's as good as its word.

MICROCOMPUTERS

LEXISOFT, INC.
Spellbinder

Lexisoft, Inc. has introduced its Spellbinder Word Processing & Office Management System for the Hewlett-Packard Co. HP 110 portable computer.

Spellbinder reportedly offers mail merge, forms and data handling, columnar manipulation and an on-screen calculator. Files created by Spellbinder on the HP 110 can be read by Spellbinder running on the HP 150 desktop computer, the vendor said. The package also reportedly offers a spelling and grammar checker, automatic hyphenation, footnoting and a mail-label generator and can interface with most printers. Spellbinder is priced at $495.

Lexisoft, Box 1378, Davis, Calif. 95617.

SAMKHYA SOFTWARE CORP.
Pik'r

Samkhya Software Corp. has announced Pik'r, a formatting package that runs on the IBM Personal Computer.

The program reportedly allows users to choose data from any report and reformat the data so it may be used with various data base management, spreadsheet and word processing packages. Pik'r allows Ascii files generated by a mainframe program to be formatted for use by microcomputer applications, according to the vendor.

The product provides editing features that allow a user to reformat rows and columns of data with a single keystroke, the vendor said.

Pik'r is said to support Ascii, Comma Separated Value, Sylk, Data Interchange Format and PRN (used for Lotus Development Corp.'s 1-2-3 and Symphony) files.

Pik'r costs $95.

Samkhya Software, P.O. Box 142, Petaluma, Calif. 94953.

MONTEX MICROSYSTEMS
PA32/20

Montex Microsystems has introduced its PA32/20 logic analyzer for the IBM Personal Computer.

The PA32/20 reportedly features symbolic trigger setup, timing diagram display and a symbolic assembly language display that is organized like an assembly language print listing. The software reportedly permits users to load symbol tables from a symbol table file, link map, print file or a combination of the three.

The PA32/20 also reportedly is compatible with Micropro International Corp.'s Wordstar program, allowing displayed data to be saved and later merged with text.

The PA32/20 is priced at $1,495.

Montex Microsystems, P.O. Box 1845, Huntsville, Ala. 35807.

DBI SOFTWARE PRODUCTS
Trajectories SPC1

DBI Software Products has announced Trajectories SPC1, a statistical package that is said to maximize the use of data for discovery of the most critical variances and the manipulation of a process control data set.

Features of the product include average bar chart, range chart, standard deviation chart, median chart, moving range charts, histograms and up to 100 subgroups per file, the vendor said. The program reportedly also does pattern analysis, process capability and percentage out of specification.

The product requires Microsoft Corp.'s MS-DOS or IBM's PC-DOS operating systems and requires 256K bytes of random-access memory.

Trajectories SPC1 costs $795.

DBI Software, One Energy Place, 5805 E. Pickard Road, Mount Pleasant, Mich. 48858.

XYZT COMPUTER DIMENSIONS, INC.
Integrated Workstation Software for the IBM Personal Computer XT

XYZT Computer Dimensions, Inc. has introduced a version of its Integrated Workstation Software (IWS), an operating system utility, for the IBM Personal Computer XT.

IWS reportedly allows users to install up to 64 application programs as menu selections, allowing them to access programs by highlighting selections rather than entering program names. The product also contains an interface to the disk operating system that is said to allow users to select DOS commands from a menu.

IWS' directory processor reportedly lists files and subdirectories on the hard disk in alphabetical order.

IWS is priced at $195.

XYZT Computer Dimensions, Suite 812, 150 Broadway, New York, N.Y. 10038.

GOLDATA COMPUTER SERVICES, INC.
Goldatabase 5.0

Goldata Computer Services, Inc. has announced an enhancement of its Goldatabase package for the IBM Personal Computer line.

Goldatabase Version 5.0 reportedly includes on-line Help screens, 10 screens for each data base, an increase in record length from 1,022 to 16,000 bytes and an increase in the number of keyed fields to 300.

The software is provided with a user's manual, and user assistance is available from a Goldata support line.

Goldatabase 5.0 is priced at $495.

Goldata Computer Services, 2 Bryn Mawr Ave., Bryn Mawr, Pa. 19010.

EXCALIBUR TECHNOLOGIES CORP.
Savvy Retriever

Excalibur Technologies Corp. has introduced Savvy Retriever, a data

Continued on page 82

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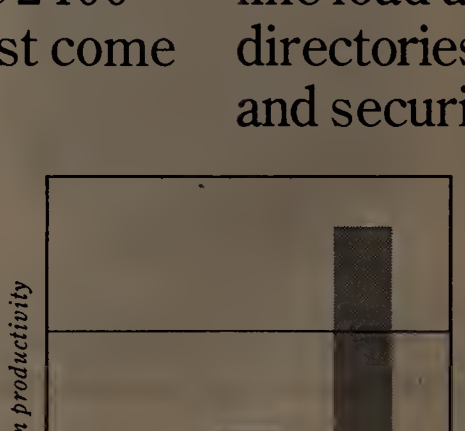

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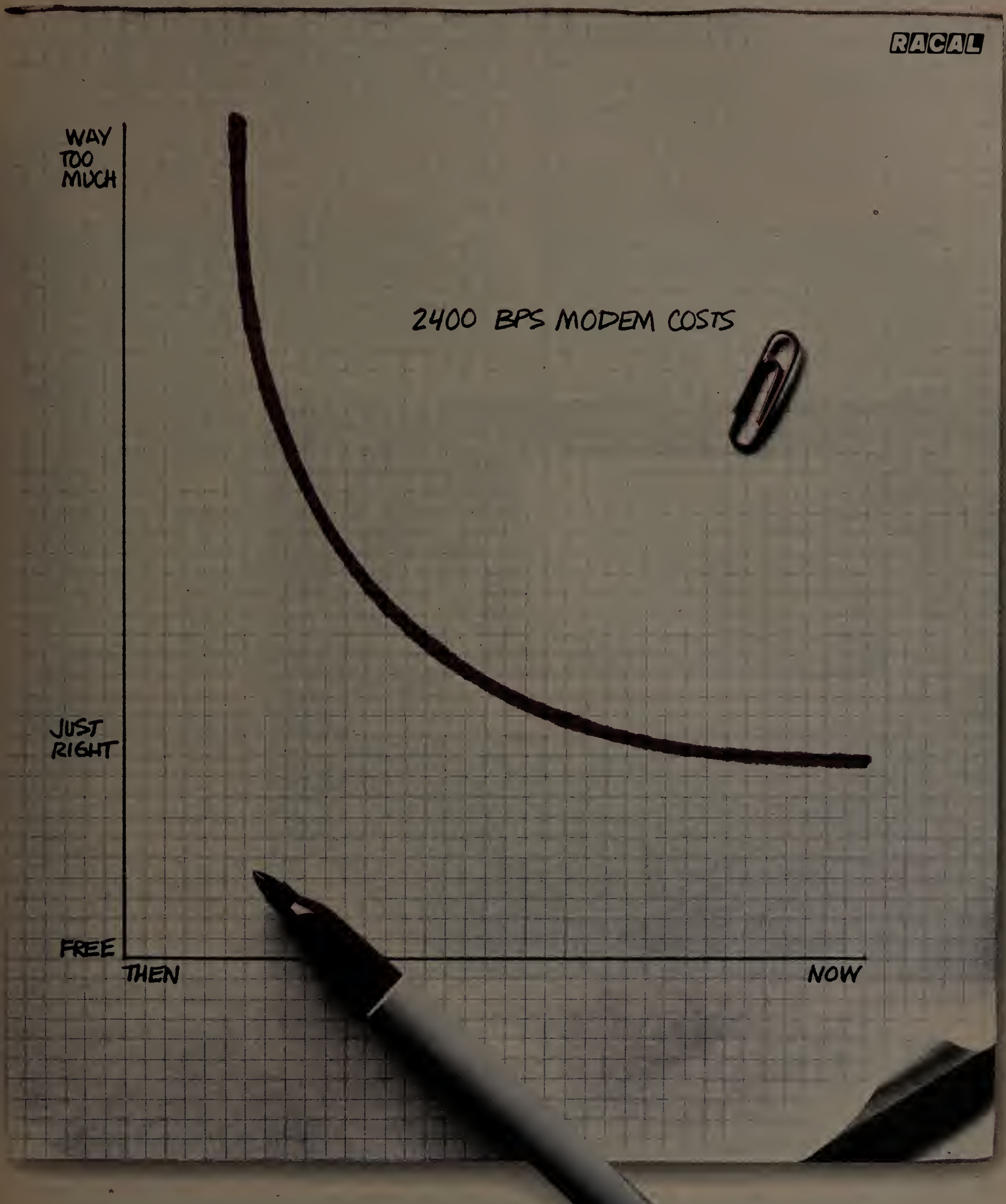

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1525 McCarthy Blvd.,
Milpitas, CA 95035.

Racal-Vadic

Makers of The Maxwell Modem.™

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Continued from page 79

retrieval tool that runs on the firm's Savvy PC personal computer line.

According to the vendor, Savvy Retriever converts plain-language requests for data into formal, structured queries.

The product does not have to parse a query or analyze it according to rules of grammar, since it uses pattern recognition to determine the general meaning of the informal request, the vendor said.

The tool is said to convert any IBM PC-DOS file into a Savvy file, allowing free-form access to most PC-DOS data files created by various applications software.

Savvy Retriever is priced at $200, the vendor said.

Excalibur Technologies, 21 Mercado, 800 Rio Grande Blvd. N.W., Albuquerque, N.M. 87104.

PACESETTER SOFTWARE, INC.
Enhancements to Organization Map Jr.

Pacesetter Software, Inc. has announced an enhancement to its Organization Map Jr. package that allows managers to create traditional organizational box charts.

According to the vendor, Organization Map Jr., which operates on the IBM Personal Computer and Personal Computer XT, consists of two components.

The Human Resources Decision Support System provides a description of an organization's structure, including layers of management, spans of control and staffing levels, Pacesetter said. The system can serve as a human resource information system that allows a user to maintain employee data.

The Organization Analysis and Productivity Improvement Support System provides a detailed view of work activities taking place within an organization, indicates where the activities occur and calculates costs.

Organization Map Jr., with organization chart capability, is priced at $895.

Pacesetter Software, P.O. Box 5270, Princeton, N.J. 08540.

FEROX MICROSYSTEMS, INC.
Encore Version 2.0

Ferox Microsystems, Inc. has announced an enhancement of its Encore decision support system for the IBM Personal Computer.

Encore Version 2.0 is said to feature 75 new Exec commands, enhancing its modeling language; 15 new logic functions for description of calculations; and Quick Report, an automatic report writer. Encore's built-in word processor has been enhanced to include Word Wrap in its editor mode, the vendor said.

The number of Help screens in the enhanced version have been increased from 10 to 50, according to the vendor. In addition, documentation has reportedly been reorganized and a function key template, to fit onto the IBM keyboard, has been included.

Encore Version 2.0 remains priced at $695. According to Ferox, Encore is also available in a runtime version, which offers the same power as the full version minus the logic and Exec compilers, at $180.

Ferox Microsystems, Suite 611, 1701 N. Fort Myer Drive, Arlington, Va. 22209.

See **TOOLS** page 86

SERVER

from page 75

as servers. Krause claimed, however, that the 3Server costs about the same as the AT and offers more than twice the performance in departmental productivity use and up to five times the speed in transactional use.

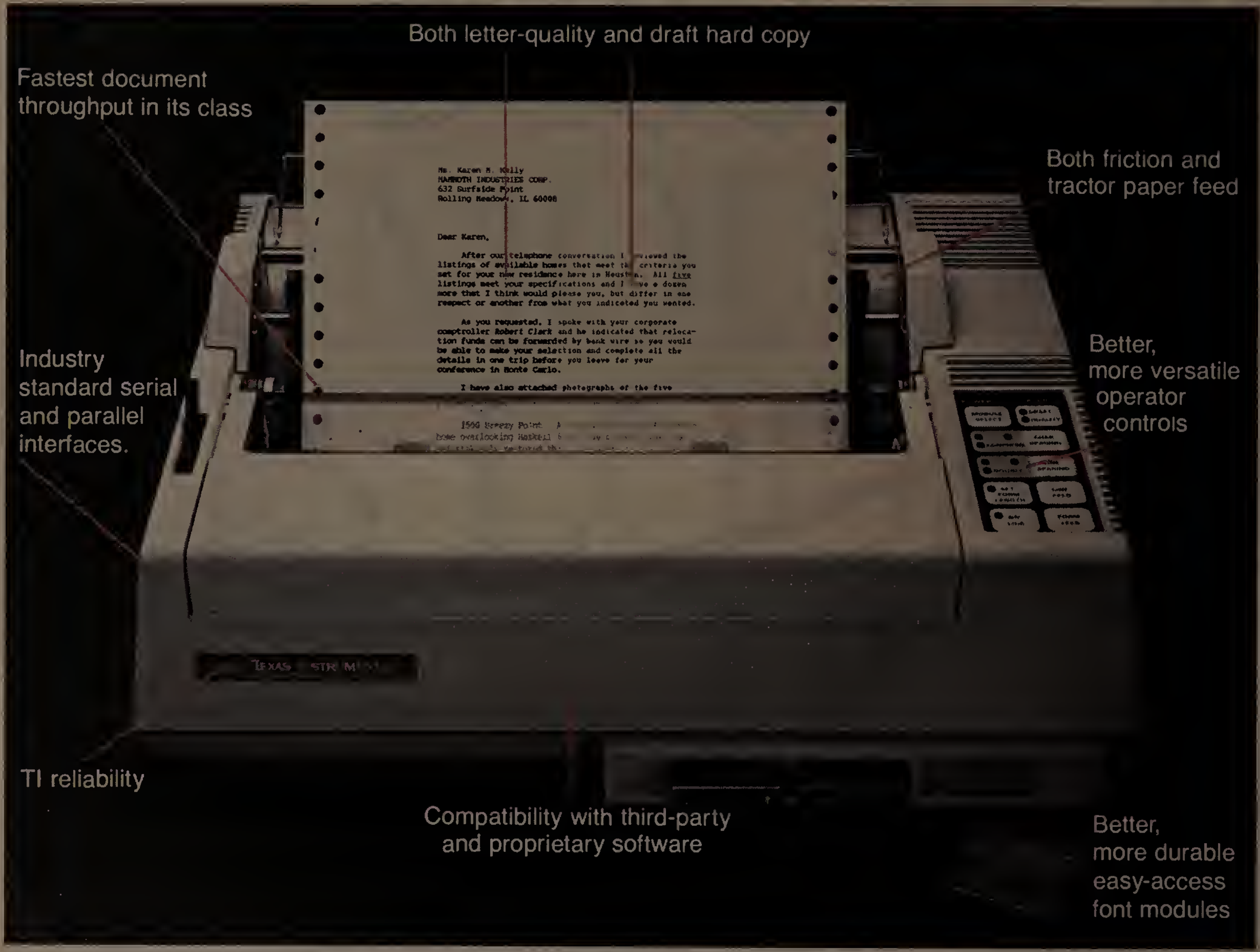
The new system will operate with Release 2.4 of the firm's Etherseries 4 software, including Ethershare, Etherprint and Ethermail, Pollack said. In addition, 3Com reportedly plans to offer two communications packages by July.

Will provide remote access

According to 3Com, Etherterm will provide access to remote computers or services, along with IBM 3270 terminal emulation. Remote Ethermail reportedly will give users dial-in electronic mail retrieval.

Late in the second quarter of 1985, 3Com also will sell port expanders for the 3Server, including ports for IBM Synchronous Data Link Control and Apple Computer, Inc. Applebus communication protocols, according to Pollack.

3Com is located at 1365 Shorebird Way, Mountain View, Calif. 94039.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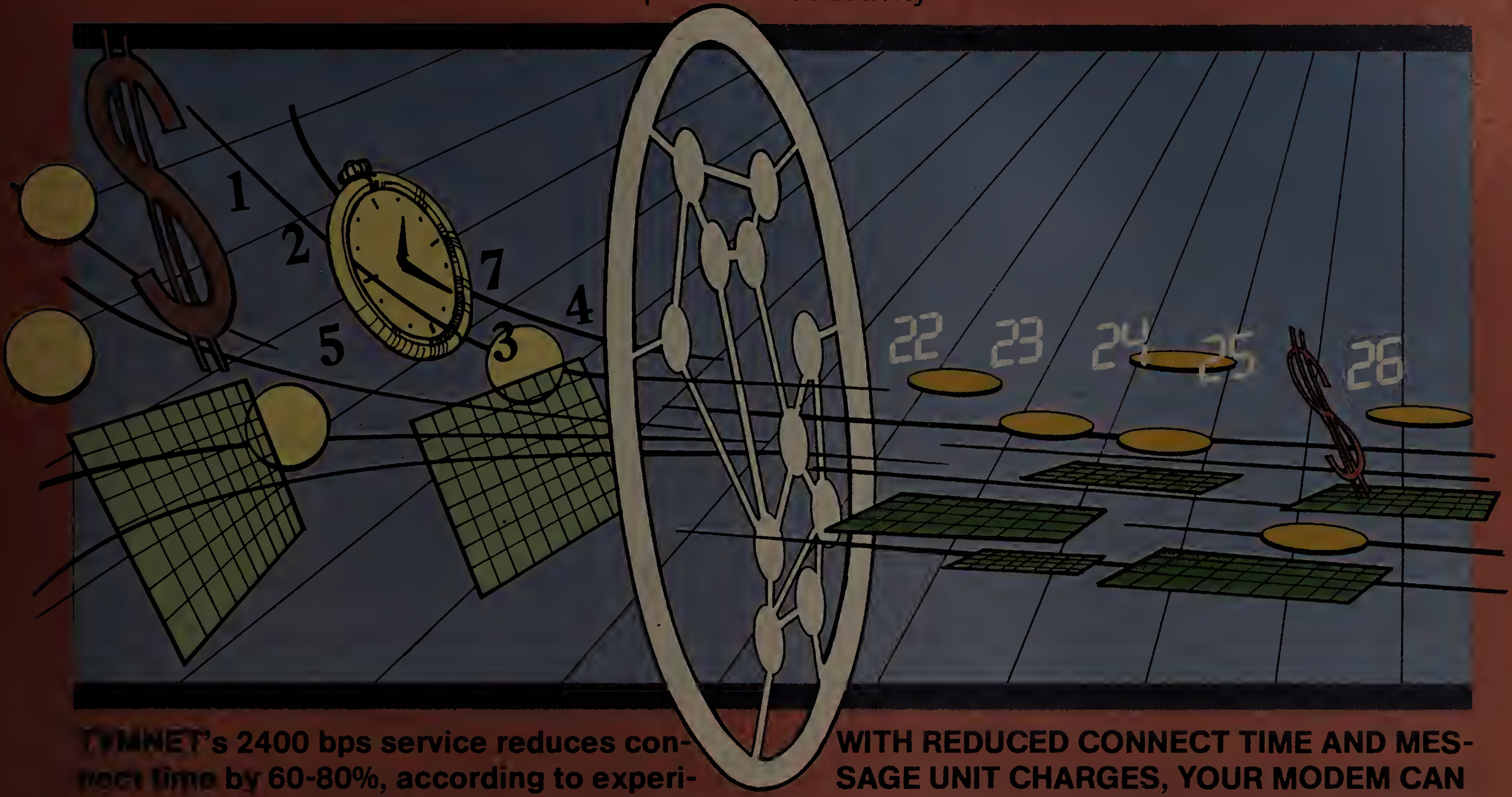

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DESIGN

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at this point in time.

Any self-respecting executive workstation comes with a set of more-or-less integrated office automation applications: a word processor, a desk organizer, electronic mail and all the rest. Providing these applications may be relatively straightforward (pick among hundreds of third-party packages and put a proprietary stamp on the collection) or complex (rewrite it all for the operating environment).

Let's throw all of this in, along with more voice functions: a speakerphone, voice store and forward, voice-annotated text, modem and intelligent communications software with "transparent" connection to everything in the outside world moving at 300 bit/sec or faster.

A host of special graphics functions, an image scanner and processor like the Wang Laboratories, Inc. PIC Image Processing System and an interactive videodisk system also might come in handy. Then we could add access to several encyclopedias or other data bases via a few gigabyte-level laser storage systems.

A local-area-network connection, and links to the departmental computer and to the company mainframe (complete with natural-language front ends) would be important. A broadband net for videoconferencing might also have its place. And several laser printers are essential — one bolted to the desk for confidential memos.

Stash laptops under desk

For corporate takeovers and such, our executive should stash a few 16-bit laptop microcomputers (preferably set up with automatic hookups into cellular phone systems) under the desk as well.

However, that desk is starting to look like the bridge of the starship *Enterprise*, so maybe it's time for the executive to buy another one the size of a paddle tennis court.

But this whole daydream, of course, ignores the question of what the executive actually needs, which is more than a plausible sounding and technically robust product. For example, multitasking seems almost basic to effective communications. But if that is true, why haven't hundreds of thousands of users grabbed copies of Digital Research's Concurrent PC-DOS, which really does seem like a useful package? Another example is the touch screen — why hasn't it become a mainstream product?

As we keep hearing, the true selling point is not the jazzy, new feature but the answer to a genuine need, followed through with backbreaking attention to detail. And, for an executive workstation, the right place to start seems to be simply an intelligent phone with excellent connections that truly integrates some microcomputer functions in a comfortable way.

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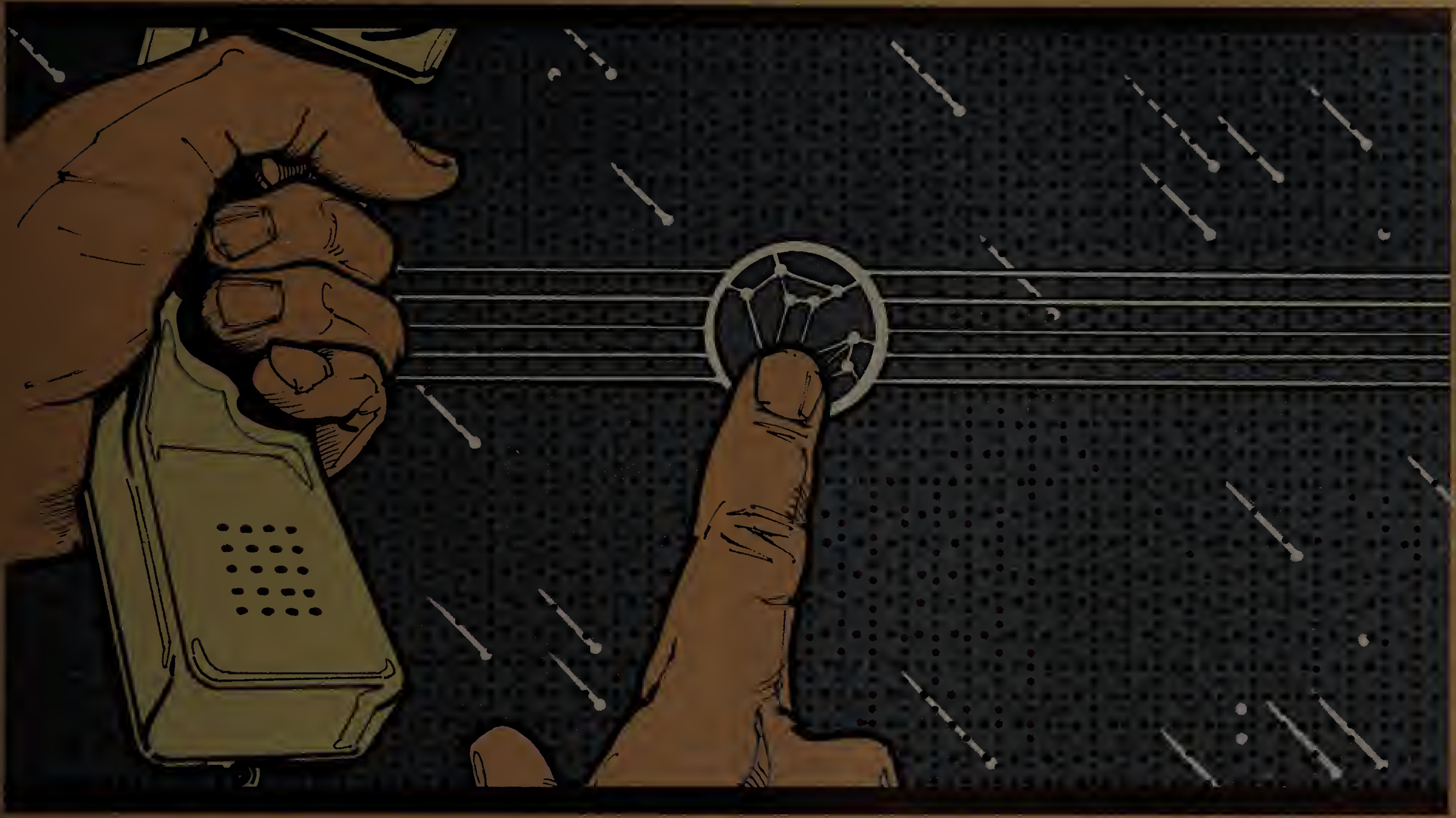

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MICROCOMPUTERS

TOOLS from page 82

DATAMEDIA CORP.
Philon compilers

Datamedia Corp. has introduced a family of compilers for Datamedia's 1600 series of AT&T Unix System V-based 932 supermicros.

The family consists of Fast/Cobol, Fast/Basic-C and Fast/Basic-M, which reportedly generate Motorola, Inc. 68000 native code. Most Cobol applications can be ported to the Datamedia 932 using Fast/Cobol's translation capability.

Fast/Basic-C and Fast/Basic-M reportedly allow existing personal computer applications written in Basic to be ported to a shared computing environment.

Fast/Cobol is priced at $2,200. Fast/Basic-C and Fast/Basic-M are priced at $600 each.

Datamedia, 491 Amherst St., Nashua, N.H. 03063.

MINITAB, INC.
Minitab Data Analysis Software

Minitab, Inc. has introduced a version of its Minitab Data Analysis Software for the Digital Equipment Corp. Professional 350 personal computer.

Among the analyses that users will be able to perform using the software are descriptive statistics, multiway cross-tabulations and correlations, the vendor said. The product reportedly has simple, multiple and stepwise regression capabilities.

The Professional 350 version offers the same statistics, data manipulations and graphics capabilities as the DEC VAX-11 superminicomputer series and PDP-11 minicomputer series versions of the program. The software is $500 for each of its three modules.

Minitab, 215 Pond Laboratory, University Park, Pa. 16802.

AT&T from page 75

hosts or data base services.

The software operating system, AT&T Unix System V, will permit direct user access to the Unix shell and will have a task-oriented user interface that includes menus, action keys, a mouse option, screen labels, multiple windows that will permit data and file transfers between applications and a terminal emulation feature.

The monitor, a standard monochrome unit with green-on-black or black-on-white display, will have a high-resolution capacity with a 720- by 340-pixel, bit-mapped display in an 80- by 20-col. format.

The FCC, which has granted type approval to the PC 7300 certifying that it will not harm the regulated telephone network, said Convergent Technologies originally submitted the detailed information, and AT&T Information Systems later assumed responsibility for the filing by placing its name on it.

LAPTOP from page 75

of the programs.

Improvements in the word processing program consist of the ability to set the width, left margin, top margin and page size, according to the vendor. Also, a user can now stop printing or transmitting a file at a specific page or a line on a page. The 4½-lb Model 200 has a battery life of 10 to 16 hours.

The TRS-80 Model 200 costs $999. Price of the 24K-byte RAM expansion kit is $249.95. The machine will be available in March.

Tandy said it does not have plans to stop production of the Model 100, which is priced at $399 for an 8K-byte RAM version and $599 for a 24K-byte RAM model.

Tandy is located at 1800 One Tandy Center, Fort Worth, Texas 76102.

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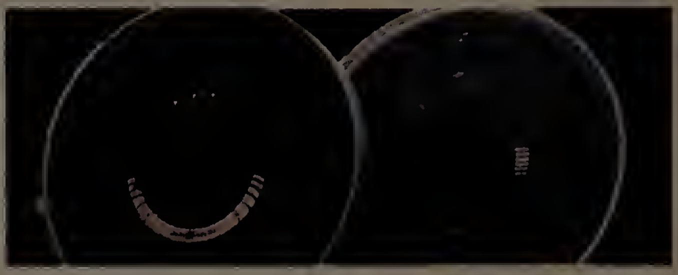

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COMPUTER INDUSTRY

Export rules relaxed for low end only

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — Long-awaited regulations that will govern the export of microcomputers, telecommunications equipment and software were recently published by the U.S. Department of Commerce as part of an effort to inhibit the acquisition of technology by Soviet bloc countries.

The latest regulations — additions to the Commerce Department's Commodity Control List — spell out the performance parameters of equipment and software, stating that they will not be allowed to leave the U.S. before being reviewed by and obtaining individual license approval from the Commerce Department. The regulations govern the export of computers, telecommunications equipment and software destined for other Western countries allied with the U.S. as well as the Eastern bloc countries.

Small computer manufacturers are especially upset about the latest rules because they expected them to be more liberal. "Industry exporters are confused. This will allow subjective interpretations of what an export is for to determine its fate. I bet our country will lose $1 billion in sales a month because of this," said William Chastka, vice-president of Washington Resources International, an export management consulting firm here.

All computers with processing data rates below 2 million bit/sec and 1.1M bytes of internal memory storage have been decontrolled and will not require a Commerce Department license before export. This category would include the Apple Computer, Inc. Apple II, and the Tandy Corp.TRS-80 models.

All computers exceeding this 8-bit computer threshold generally will require an export license, according to new export regulations.

The new rules set forth the parameters of computer systems that will be placed under export controls by determining what their performance capabilities are. For example, computers "embedded" within a piece of equipment that could not run without its presence cannot exceed a processing data rate of 28 million bit/sec, and a computer "incorporated" into equipment where it can be removed cannot exceed a processing data rate of 5 million bit/sec or it will require a validated export license.

The new regulations outlining the additions to the Commodity Control List are the U.S. government's concluding effort to implement the agreements it worked out with its 14 other allies last September at the meeting of the Coordinating Committee on Multilateral Export Controls.

Officials in the Department of Commerce's International Trade Administra-

See **EXPORT** page 97

■ A systems software company has new owners, changed its name and hopes to revive its fortunes/**91**

■ Control Data Corp. turned over marketing of its supercomputers to ETA Systems, Inc., a spin-off charged with developing a next-generation machine/**95**

■ California officials said a tax reform provision that effectively taxes R&D spending was a mistake and will be corrected/**96**

Northrop faces 18 suits, faults past subsidiary

By Kathleen Burton
CW West Coast Bureau

LOS ANGELES — A diversification into commercial computing in 1972 by the Los Angeles-based Northrop Corp. has resulted in an $18 million arbitration award to users and is expected to become the focal point of a multimillion-dollar legal battle involving medical groups throughout the U.S.

An arbitrator's judgment of an $18.3 million settlement against Northrop, which must still be confirmed by a Superior Court judge in Torrance, Calif., was awarded in a suit against the company by the Richland Medical Group in Racine, Wis., which allegedly purchased a faulty Northrop computer system that snarled its billing system, lost patient records and broke down because of faulty software.

This is the first of 18 similar lawsuits that will be brought by doctors and medical groups across the country which had purchased the Northrop Medical Business Computer Systems for medical office bookkeeping between 1972 and 1980, said Robert Kilborne, an attorney representing the medical groups in Los Angeles Superior Court. Four of the pending suits are expected to come to trial in 1985, Kilborne said.

Kilborne's clients also claim Northrop underfinanced Northrop Data Systems, Inc., the company's commercial computer subsidiary, sold approximately 370 computers over an eight-year period and then let the subsidiary go bankrupt in 1980, leaving the useless computer systems in the marketplace.

Kilborne said Northrop claims that the subsidiary was a separate corporation and that the parent company had no involvement in the design, development or manufacture of the computers.

Northrop discontinued its venture into commercial computing in 1980, selling the division to a small New Jersey firm that

See **NORTH** page 97

Convergent names new CEO

Veteran HP vice-president takes helm, former company CEO remains as chairman

SANTA CLARA, Calif. — Convergent Technologies, Inc. announced last week that Hewlett-Packard Co. veteran Paul Ely Jr. had been elected president and chief executive officer (CEO) by the board of directors. Former CEO Allen H. Michels remains as chairman of the company.

Ely, as an executive vice-president at HP, built up HP's computer business to a $3 billion operation in 1984. In a reorganization at HP in July, Ely shifted from computer operations to lead a division including medical and analytical products and research laboratories; industry observers said at the time that Ely was shunted in the bid to succeed John A. Young, HP president and chief executive officer.

Michels, 43, said that Ely, 52, had the experience and professional skills to assure profitable growth for Convergent Technologies. "The time had come to bring aboard a truly outstanding professional manager with the experience necessary to help us meet the challenges of the future," Michels said. Convergent said Ely, who was also named to the board of directors, will receive a $300,000 salary along with a $1 million bonus, stock purchase rights and "the right to receive" an additional $1.6 million bonus payable in installments in 1986 and 1987. In a statement, Ely said, "Convergent is an exciting company at a critical stage in its development."

In another move, company cofounder Ben Wegbreit, 39, was named executive vice-president.

NEC takes Intel to court over copyright charges

By Kathleen Burton
CW West Coast Bureau

SAN JOSE, Calif. — NEC Electronics, Inc., a subsidiary of NEC Corp., has filed suit in U.S. District Court here against Santa Clara, Calif.-based Intel Corp., seeking to thwart Intel's alleged copyright infringement threats.

The dispute concerns two NEC Cmos microprocessors, the V20 and V30, announced last April. The NEC products are referred to in semiconductor parlance as "supersets" of Intel's 8086 and 8088 microprocessors, meaning they are fundamentally identical but enhanced versions of the Intel products.

According to Bob Hinkley, legal counselor for NEC Electronics, Intel informed NEC it was considering copyright infringement charges. NEC's suit seeks an injunction that would bar Intel from suing NEC on these charges once U.S. sales of the microcomputers commence, Hinkley said.

To underscore that the V20 and V30 microcodes did not infringe on Intel's copyrights, Hinkley said that in July, NEC voluntarily gave Intel a V30 sample to compare with the 8086 and 8088 chips. Intel is still analyz-

See **NEC** page 97

INDUSTRY INSIGHT/PETER BARTOLIK

Vendor battles to rev up home computer market

The confusing cabbage patch of the home computer market, relatively quiet since the departure of Texas Instruments, Inc., appears to be building up for yet another loud battle for the lucrative heart and mind of the American consumer.

Although Coleco Industries, Inc. all but abandoned the arena and traded off its innovative but ill-fated Adam computer to concentrate on toys and dolls, the big boys are just starting to play in this ballpark.

IBM has lowered the price and enhanced the configuration of its PCjr. Apple Computer, Inc. is scoring big with its attractive Apple IIc, although the company is seemingly more intent on moving its Macintosh into big business.

Yet, as these two leaders from opposite ends of the spectrum cross paths, the always-entertaining Jack Tramiel pops up yet again to declare that the

See **COLUMN** page 97

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Value Software execs set management-oriented course

By Peter Bartolik
CW Staff

FRAMINGHAM, Mass. — Indoctrinating a highly technical product team with a market orientation is the key for future success at Value Software, Inc. of Cherry Hill, N.J., according to the firm's new owners and executive team.

Formerly known as Value Computing, Inc., the vendor of systems software for data center management was recently sold to a group of private investors led by Harvey Kimmel, the new chairman and chief executive officer (CEO) who was formerly a director of Execucom Systems Corp. and instrumental in the sale of that company.

In an interview here recently, Kimmel and Harry S. Gierhart, the company's new president and CEO, said they intend to revive interest in Value Software products by becoming more visible in the market, developing enhancements to meet the needs of existing customers and, over the long term, building a line of integrated utility packages incorporating Cullinet Software, Inc.'s IDMS data base software.

Begun to stall

According to Kimmel, who placed the privately held company's annual revenues at about $7 million, Value Computing in recent years had begun to stall, even though it had posted profits in 14 of its 15 years of operation. Kimmel said the company had not invested greatly in products in recent years, but was attractive because of its more than 1,000 user sites and existing products.

The previous owners were strong on technical knowledge, whereas the new owners believe they are strong in management skills and motivational leadership, Kimmel said. "The company was definitely stalled, numerically and motivationally," he said, adding that its bottled-up potential is almost ready to explode. The company was built on systems software products for use in IBM's MVS and VS1 operating environments, offering a production scheduling and control system, a job accounting and billing system, a tape library management system, System Management Facilities data management system and more recently the Data Center Distribution System for on-line report management.

Focus on existing products

According to Gierhart, the former vice-president of marketing and sales with VM Software, Inc., the company will focus heavily on enhancing existing products that have experienced "long-term repeat customer" loyalty. But it also plans to spend $1.5 million over the next 12 to 18 months on developing products incorporating Cullinet's IDMS. "There is a tremendous future for systems software [incorporating] data base management systems," he said. The products are self-contained, and users will not have to license the Cullinet product, he added.

Kimmel insisted that the new owners of the 80-employee company are taking a long-term view and intend to pour money back into the company; the investors have agreed that no dividends will be paid out, he said. Kimmel also said his "personal preference" is not to take the company public if the new team is able to revive revenue growth.

Operational changes, Gierhart said, have focused on increased product training for the sales staff, improved communications between field staff and the technical development team, responsive customer support, installation of a customer advisory board, a shift from departmental management to product-line management and an aggressive outreach program to have executives meet with current customers.

The executives expressed somewhat differing philosophies when asked about the relative values of developing products in-house and acquiring existing products from other companies. Gierhart said the focus for now would be on internal development unless a product was available that met the company's strategic goals. Kimmel said, however, "I will continue to keep my ears to the ground" for possible acquisitions that could boost the company image.

AT&T inks micro distribution pact

MORRISTOWN, N.J. — AT&T Information Systems said recently that it has signed agreements with 44 independent resellers to distribute its PC 6300 personal computers and 3B series of computer systems.

AT&T said it is forming two distribution channels for resellers. Larger value-added resellers will obtain equipment directly from AT&T Information Systems. In addition, a "select group" of value-added system distributers will act as the distribution channel for AT&T computers to smaller resellers, AT&T said.

Last March, AT&T introduced six models in its 3B line, which includes systems ranging from multiuser desktop microcomputers to superminicomputers.

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Miscalculations in documentation, deadlines, details

OUTSIDE LINES
Arthur Bardenhangen
and Joseph Colleran

Second of two parts

As we explained last week, our study of administrative procedures by exporters revealed a number of common documentation errors that serve to delay payments to exporters, or even result in lost overseas sales.

The study pinpointed the 10 most common errors exporters make, which are listed here in order of importance:

■ Exporters present the necessary documents after the letters of credit have expired.

Typically, an exporter is from a few days to a week late. But late is late — even if only one day. The letter of credit is no longer valid and must be reauthorized by the buyer and his bank.

■ Exporters ship their goods later than the credit allows.

Again, late is late, even if it is only a few days. The last date for shipment specified in the credit has passed.

Again, the exporter may not have studied the terms of the credit. Or he may not have checked shipping schedules; when he does, he may find that only two ships a month go to the country of destination.

Usually, we can obtain a waiver from the importer on this matter. But this is not guaranteed. And even when we succeed, the price of the goods may have fallen in the international market. So the importer may offer to pay less for the goods, under threat of not making the purchase at all.

■ Exporters try to draw down more money than their letters of credit allow.

This often happens when a credit permits partial shipments of goods. An exporter has an order for $100,000 worth of his products, so he ships $25,000 worth, then a month later $30,000 worth, then in the third month another $25,000. In the fourth month, he ships a final $25,000 worth, making a grand total of $105,000. In many such cases, the exporter has told the importer he would overdraw on the letter of credit, or the importer has slightly increased his order. Yet the importer fails to tell his own bank of these changes and have the letter of credit amended.

In such cases, we do one of three things: telex the importer's bank for permission to pay the higher amount; forward what documents we have to the importer's bank and request permission to pay; or, if the exporter is our customer, accept his written indemnity that he will hold us blameless if we make payment. Although one of these steps usually works, we know of cases where the exporter has had to find another buyer.

■ Exporters delay presenting documents for an undue period.

A letter of credit sometimes specifies that an exporter must present his documents to his bank within a specific period of time after shipping his goods, even though the credit may not be near expiration. This period may be five, 10, 15 days, whatever. But if no cutoff is specified, the rules of the Uniform Customs and Practice for Documentary Credits (UCP) apply. These stipulate that the exporter must present his documents within 21 business days after the goods are shipped, yet many exporters wait too long to prepare or obtain the necessary documents.

■ Exporters make unallowed partial shipments.

Some letters of credit permit partial shipments, some do not. When they do not, some exporters make such shipments anyway.

There are two reasons why. First, once again, they may not have studied the terms of the credits. Second, they may have one-half of an order ready and decide to forward it in hopes of obtaining early partial payment.

Yet we cannot make such payments unless the full orders are shipped. The letters of credit do not allow it.

■ Exporters make invoices that do not describe the merchandise exactly as it is described in their credits.

A letter of credit may specify that an exporter is to ship a certain number of spare parts for a particular computer. If the exporter's invoice merely says "computer spare parts," this is a discrepancy.

■ Exporters do not supply all the documents required for their letters of credit.

Why not? Pure oversight is one reason. Inability to obtain necessary documents or certification of them is another. A desire to avoid paying fees — say, for weighing the goods — is a third.

Usually, this kind of error is easily correctable. We merely wait until

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Bardenhangen is a vice-president in the Trade Finance Division of Irving Trust Co., New York; Colleran is a vice-president in the Credit Services Division of the same company.

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account for exporting loss of sales, delays in payment

the exporter obtains what is necessary. Yet he does not receive his money until he does what is required. And in the meantime, his letter of credit may expire or its grace period elapse, considering all the risks those contingencies involve.

- Exporters do not have documents legalized.

Some documents, such as customs invoices, must sometimes be notarized or receive some other kind of legal imprimatur from a third party. If an exporter fails to get the job done, he may not find it easy to rectify his mistake.

It can take time to obtain documents, especially if a consulate of a foreign nation is observing a home-country holiday or wants to see a bill of lading or other documents relevant to the shipment.

Furthermore, circumstances may work against the exporter. During one of the recent Arab-Israeli wars, Arab nations became so irate at the U.S.' attitude that they closed all their consulates in this country. Ethiopia once did the same thing to mourn the death of its former leader Haile Selassie. In both cases, exporters could do nothing but wait — or obtain waivers. Yet they might have avoided the problem altogether by allowing more time to obtain what they needed.

- Exporters fail to obtain completed onboard bills of lading.

Goods bound overseas are sometimes scheduled to go on one ship, but actually end up on another. The exporters learn of the last-minute switch too late and then present bills of lading that lack an onboard stamp from the appropriate carrying vessel or that contain one that is undated or unsigned.

Obviously, these bills of lading are unacceptable, and the exporters cannot be paid until the problem is corrected.

- Exporters fail to obtain insurance coverage soon enough.

This discrepancy is the most ironic of the group. That is because many companies that export regularly have an open-ended arrangement with their insurers that allows them to write their own policies for whatever amounts and periods of time they wish. Yet sometimes their shipments leave on, say, Dec. 15, and they do not write the policies and get them approved until Dec. 18. This is in violation of the UCP, which requires that insurance cover the movement of goods from warehouse to warehouse.

Errors can be rectified

As you can see, most of these 10 common errors can be rectified. Even so, there are always drawbacks and risks. The exporters must pay for discrepancies that cannot be corrected. They do not get their money when they could. And they run the risk that their products' prices will suddenly fall or that their buyers will back out of the deals altogether once they learn of the documents' discrepancies. Indeed, in recent years we have experienced refusals to consummate purchases more and more often.

Virtually all of these errors could be prevented. Exporters need only study the terms of their letters of credit, allow themselves time to fulfill these terms, then pay attention to detail.

They will help themselves further if they retain experienced forwarders or customs house brokers because these agents often prepare some of the documents relevant to letters of credit and perform other valuable and timely services.

CDC transfers sales functions

MINNEAPOLIS — Control Data Corp. recently announced the transfer of sales and marketing functions for its Cyber 205 supercomputer to ETA Systems, Inc., the CDC spin-off previously designated as responsible for development of a next-generation supercomputer to succeed the Cyber 205.

ETA, which is 90% owned by CDC, will assume worldwide marketing responsibilities for the Cyber 205, while CDC will continue development, manufacturing and maintenance of the product, including support of the customer base.

Some 50 CDC employees will be affected by the transfer but will have the option of staying with CDC to sell the Cyber 800 series or to obtain other employment within CDC.

ETA was formed in 1983 when CDC spun off the development unit for a Cyber 205 successor and founded an independent company designed to raise equity financing. CDC, however, still holds its 90% interest in the company despite earlier intentions to raise equity funding from outside sources. CDC said it has an installed base of 27 Cyber 205 machines but expects the market for supercomputers to open up.

ETA will sell the CDC machine in addition to its own ETA10 machine that is compatible with the CDC unit and scheduled for shipment next year.

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COMPUTER INDUSTRY

California officials seek to repeal tax reform provision

By Kathleen Burton
CW West Coast Bureau

SACRAMENTO, Calif. — California state officials said legislation was introduced last month to repeal a provision of a tax reform package that would tax corporate research and development spending and could cost Silicon Valley companies millions of dollars in taxes.

Although the tax provision was part of legislation that California Gov. George Deukmejian signed into law in September 1984, the controversial provisions were not discovered until late December, said a spokesman for Deukmejian.

The controversial provision of A.B. 2215, sponsored by California Assemblyman Thomas Hannigan, was signed into law erroneously, said Ellen Worcester, a consultant to the California Assembly Revenue and Taxation Committee. The package was designed to make California tax codes conform to the Internal Revenue Service federal code, but the provision in question failed to duplicate a federal exemption for corporate R&D spending. Such tax snafus are not that unusual, Worcester said, because of the technical language of tax law and occasional drafting oversights.

Legislation repealing the provision will be sent to the governor by March 15. That date is the deadline for changes to be made if companies are to avoid paying the tax for 1984, said a California state franchise tax board official.

Asked if Deukmejian would sign the bill, a spokesman for the governor's office said that it is Deukmejian's policy not to make announcements about the signing of pending bills until they reach his desk.

In the Silicon Valley, many high-technology companies rely heavily on R&D technologies to compete against foreign and domestic firms. Executives of several companies here said the new tax, if not repealed, would have severe consequences and could discourage companies from setting up R&D operations in California.

Although quarterly tax payments were due on Dec. 15, Silicon Valley companies said that with the tax law extensions available for multinational corporations, there is still time to see how the pending legislation develops before making significant payments. Dan Lightman, tax director at Intel Corp., a Santa Clara, Calif., semiconductor manufacturer, said that since California is relatively liberal on tax payment extensions, the company has until October before full payments are due. All multinationals will use these extensions, he said, where it concerns retroactive pending legislation. "We are confident A.B. 2215 was a mistake," Lightman added.

Tax attorneys for two other Silicon Valley firms, Hewlett-Packard Co. and National Semiconductor Corp., said that their firms' fiscal years are structured so they would not have to make estimated earnings payments until Feb. 15.

Clifford Jernigan, director of government affairs at Advanced Micro Devices, Inc., a Sunnyvale, Calif., semiconductor manufacturer, said that his firm would not pay the tax, banking on the passage of an amendment in March to waive possible late payment penalties.

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Memorex aims at new market

SANTA CLARA, Calif. — Memorex Corp. announced last week that it will no longer sell storage products in the OEM market and will instead focus on the IBM plug-compatible market as well as supply storage equipment for its parent company, Burroughs Corp.

The OEM business only accounted for 2% of the company's revenue in 1984, the company said. The decision came as a result of a six-month review by the Memorex management team.

Memorex also announced it will close its Westlake, Calif., manufacturing facility by midyear and assist employees there in finding other jobs. The company will seek a buyer for that facility, subject to the lease terms of Disk Media, Inc., a joint venture of Memorex and Control Data Corp. that also occupies the Westlake facility.

The Memorex/Burroughs plant in Winnipeg, Manitoba, which had been the planned site for the manufacture of OEM high-performance 5½-in. disk drives, will take on other production and refurbishment activities as a result of cancellation of the disk drive development project.

Memorex said it will seek to sell its OEM business and, in the meantime, will meet all existing commitments to its OEM customers, including replacement of parts. Not affected by the decision is the company's media products operations.

Memorex President Philip S. Dauber said the new focus "enables us to pursue even more aggressively the tremendous opportunity that now exists in the [plug-compatible manufacturer] business to supply peripheral equipment to end users of IBM and Burroughs computer systems."

NEC from page 89

ing the sample, he said.

Claiming that NEC's microprocessors were independently developed, Hinkley said that of the V20's and V30's 156 machine instructions, 23 differ substantially from Intel's 8086 and 8088 internal instructions. He said the NEC products also have "capabilities that are not found in the 8086 and 8088," including faster execution time.

Tom Dunlap, general counselor for Intel, said that the V30's microcode could have been designed in one of two ways: either totally independent of the 8086 or by illegally copying Intel's 8086 code.

Intel is still analyzing NEC's sample V30 chip to determine whether copyright infringement did occur, Dunlap said, adding that the analysis should be completed by the second quarter. "So far," Dunlap said, "the results are not conclusive but indicate that we should proceed with our investigation." The analysis is taking so long, according to Dunlap, because "Intel is not used to reverse engineering products."

EXPORT from page 89

tion last week emphasized that the regulations are not cast in stone but will be used to guide license reviews. Export destinations and the uses of equipment and software are important criteria in obtaining license approval, they said.

Peripheral devices such as disk drives that exceed 11M byte/sec transfer rates, magnetic tape drives exceeding 3.2M byte/sec transfer rates and communications control units such as private branch exchanges that exceed 9,600 bit/sec will be required to seek an export license. If a communications channel is not dedicated full-time to a given application, then it cannot exceed a 300 bit/sec transmission speed and must be connected to telex interfaces and a public switched-network service. Local-area network transmission speeds cannot exceed 10M byte/sec.

Software listed for control includes all development system software, software used for high-level programming, disassembler and decompiler software, as well as compiler and interpreter software. Left untouched were applications software programs designed for and limited to accounting, general ledger, inventory control, payroll, accounts receivable, personnel records, wages, calculation and invoice control.

Additionally, data and text manipulation software such as sort/merge, text editing, data entry and word processing were left untouched. Report generators were also left out of software controls.

NORTH from page 89

has since gone out of business.

The company is believed to have lost money on the computer operations, although the alleged loss has never been mentioned in any of Northrop's annual reports.

In a prepared statement about the recent settlement, William M. Elliott, Northrop's chief counsel, said, "The arbitration award is without jurisdiction, is erroneous, and the company intends to pursue all appropriate legal remedies."

COLUMN from page 89

home computer market is much removed from the corporate battlefield that IBM all but owns and on which Apple has focused most of its energies lately.

Tramiel, late of Commodore International, Ltd. and now head of a resurgent Atari Corp., pulled off an amazing feat at the recent Consumer Electronics Show by unveiling a Macintosh-type computer only six months after he bought out the company.

Quickly nicknamed the "Jackintosh" by industry wags, Tramiel's microcomputers offer the Motorola Corp. 68000 microprocessor, a 528K-byte memory and Macintosh-like features for $600.

Much doubt has been expressed about Atari's ability to finance production. But Tramiel has many times confounded the computer industry with his ability to turn the market on its ear. He was, after all, the helmsman who steered Commodore to the position of being one of the largest computer vendors in terms of actual units.

Need for software

The other doubt about Atari's future concerns the need for software. IBM is spending big bucks these days to inform the American consumer that thousands of software programs can be operated on the PCjr. This writer, however, cannot picture the average American consumer really wanting to be confronted with thousands of software options — games, maybe, but not a plethora of duplicative application packages that have little use in the home.

If Tramiel can pull it off, he may be able to cut a leg from under both the IBM goliath and the big-booted Apple. With his marketing savvy and bottom-line strategies, Tramiel could clean up in the mass-market arena, particularly if Apple's focus on the corporate arena continues to result in hesitant corrections to its pride-based pricing strategies.

If Tramiel can bring his machine to market, it will present Apple and IBM with a tough moving target. At the very least, his vendetta against Commodore is sure to continue the downward pressure on the prices of home computers as sophisticated machines continue to enter this arena. The reverberations could impact the higher end of the microcomputer market.

This is a story that is going to make 1985 very interesting.

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As a Regional Sales Representative, you will be responsible for providing assistance to our sales force in pre-sales presentations for our **Systems Software** products, as well as providing support to our clients in the areas of training, implementation, consulting, and demonstrations. Your background should include strong data processing and systems/operations experience. Good communications skills are essential.

This position requires working knowledge/ familiarity with UCC 1, 2, 3, 7 and 11 product lines.

Knowledge of ALC, COBOL and OS/JCL languages, IBM mainframe and DOS/OS/MVS software is preferred. 70% travel involved.

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Dallas, TX 75235

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POSITION ANNOUNCEMENTS

500 gigabytes of data... 10 million database accesses daily

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To do this, we need the help of hard-working men and women who thrive on challenges . . . people who want to enhance their careers as they put the cutting edge of technology into practical applications . . . people who need to know that the work they do is making life better for millions of Americans.

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With PROJECT MANAGEMENT experience in:

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- ADP Systems Life Cycle Development
- Development of Application Systems and Program Specifications
- Data Base Technology

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With PROJECT MANAGEMENT experience in:

- Office Automation, End User Computing, or Information Centers
- Systems Planning, Engineering, and/or Integration
- Telecommunications, including Local Area Network
- Hardware, Software, or ADP Services Acquisition for Micro, Mini, or Mainframe Computers

INFORMATION AND SYSTEMS ENGINEERS

With TECHNICAL experience in:

- Office Automation, End User Computing, or Information Centers
- Systems Planning, Engineering, and/or Integration
- Telecommunications, including Local Area Network
- Hardware, Software, or ADP Services Acquisition for Micro, Mini, or Mainframe Computers

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With MANAGEMENT AND TECHNICAL experience in:

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- Information Modeling
- Data Dictionary Techniques
- VSAM/ISAM Techniques
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DEPARTMENT OF HEALTH & HUMAN SERVICES USA

Letters of interest and resumé material may be sent to:

Social Security Administration
Systems Recruiting A-CW
G-120 West Building (High Rise)
6401 Security Blvd.
Baltimore, MD 21235

For more information, you may call (301) 594-3670.

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P/A 2 yrs DEC Basic	to $25K	Sys Prog IMS internals	to $50K
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P/A CICS/DL1-mfg	to $33K	Sys Prog - MVS	to $45K
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OPS Anal UCC-1, ACF2	to $28K	Sr P/A Tandem, TAL	to $35K
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(203) 278-7170

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(504) 835-4296

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Degree preferred. Must have 2+ yrs RPG II, Sys 34/36 exp with any appls accepted. Position due to expansion. Above average benefits/potential. **$22-26,000**

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San Antonio, TX 78201
1-800-531-5402
In TX dial (512) 736-2467

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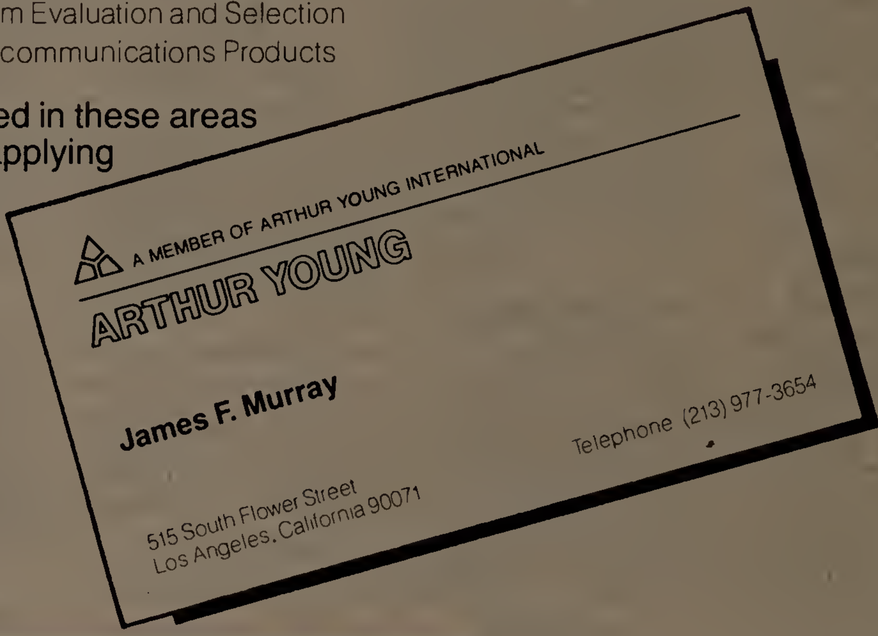

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Applications and nominations are invited for the position of Coordinator of Information Systems at Governors State University. Administrative computing is provided by an off-site cooperative center providing administrative computing services to three universities utilizing the IBM 4300 series. Academic computing depends heavily on use of microcomputers. The University also participates in a state-wide time sharing network utilizing a Cyber 170/730. Duties include: coordinating academic and administrative computing and word processing functions, developing and evaluating technical plans for automated support of various Information systems, developing policies governing automated system development and equipment/software aquisition, and recommending procurement of software and local hardware as necessary.

Applicant must have a baccalaureate degree (master's degree preferred) in Information or Computer Science, Business or related field with five years data processing experience, a significant portion of which should be in systems analysis and design. Management experience in providing computer services is highly desirable.

SALARY: Competitive
STARTING DATE: Currently Available
APPLICATION DEADLINE: January 31, 1985
Submit application or nomination to:
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Search Committee for the Coordinator
of information Systems
Office of the Vice President for
Administation and Planning
Governors State University
University Park, IL 60466

Governors State University is located in a suburban area 36 miles south of the Chicago Loop. The University has an enrollment of 5,000 upper division and graduate students in the Colleges of Arts and Sciences, Business and Public Administration, Education, and Health Professions. The University offers curricula in computer science and mangement information systems.

Governors State University is an Affirmative Action/Equal Employment Opportunity University.

NASA

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Provides technical direction and creative leadership for one of NASA's largest computing science research organizations through personal research efforts and by selection of projects which provide significant research opportunities for members of the organization. Current research activities are concentrated in graphics, concurrent processing, and data flow architectures. Branch staff includes approximately 15 computer scientists and engineers. Ph.D in mathematics, physics, engineering, or closely related discipline is strongly desired.

Chief, Program Analysis Office

Responsible for strategic ADP planning, including determination of overall technical requirements, design and integration approaches, identifying needed resources, and budget forecasting and tracking. Defines goals and objectives for integrating the functions of the organization with the computational activities at Ames and NASA Headquarters. Provides technical planning and monitoring of major projects. Manages the Center's master programming contracts. Staff includes approximately 8 members. Undergraduate degree in computer science, mathematics, or related engineering field combined with advanced degrees and broad computer technology management background is desired.

NASA-Ames is a Federal research laboratory pursuing theoretical, computational, experimental, and applied research in aeronautics, astronautics, and human performance in the aerospace environment. Excellent computer facilities include Cray X-MP, Cyber 205, IBM 4381, VAX-11/785 quad, and advanced graphics laboratory. Provision is made for competitive salaries for highly qualified individuals. Anticipated salary range $49,000 to $59,000. Civil service status not required. Must be U.S. citizen. Please send resume or SF 171 Personal Qualifications Statement to: D. E. Schilling, MS 241-6, Ames Research Center, Moffett Field, CA 94035, Attn: Box EC-4. An equal opportunity employer; minority and women applicants are encouraged.

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PL/1	IDMS DB or DC	Honeywell
FOCUS	ADABAS	
CICS		

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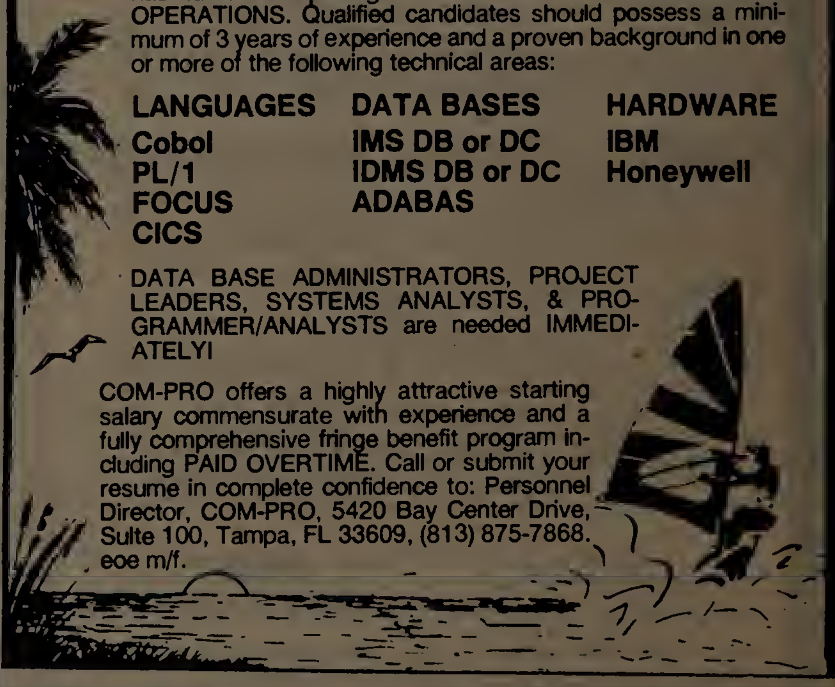

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Management Department
University of Maryland Baltimore County

Applicants should hold the Ph.D. in computer information systems or a related field and have the scholarly and professional credentials required to manage a complex and expanding undergraduate program and a proposed graduate program.

Interested candidates should submit an up-to-date Curriculum vita to: Professor Joseph F. Mulligan, Chairman IFSM Search Committee, Department of Physics, University of Maryland Baltimore County, 5401 Wilkens Avenue, Catonsville, MD 21228. UMBC is an equal opportunity/affirmative action employer.

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The University of Illinois at Urbana-Champaign Department of Physics has an immediate opening for a Computer Systems Manager to direct computer operation and develop software programs. Master's degree and computer systems management required. Salary based upon experience. Send Resumes to: Mr. Raymond F. Borelli, 205 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, Illinois, 61801. For technical information contact: Professor Larry Cardman, Nuclear Physics Laboratory, 23 Stadium Drive, Champaign, Illinois, 61820, (217)333-4541. For full consideration, applications should be received by February 1, 1985. The University of Illinois is an affirmative action, equal opportunity employer.

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- IBM Assembler Language Coding & Design experience

Systems Programming Job #6
- Operating System Development: MVS/XA, VM/SP, VM/XA
- Systems Software Internals: IMS DB/DC-FASTPATH, JES3
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- Tandem & DEC in a large network
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- Provide structure, liaison and direction to all operational activities
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- Effectively manage a technical support organization responsible for the creation and maintenance of production procedures and associated documentation for all applications executed
- Minimum of 3 years' DP management experience
- Extensive technical experience in computer operations or applications programming

Systems Analyst & Systems Managers Job #12
- Provide written procedures for operations to provide first level problem analysis and recovery
- Shift flexibility needed
- Experience with computer operations, job execution, software implementation
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- Senior position requires above plus 5–10 years' experience

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COMPANY ____________________

Are you applying for a specific position? If so, please designate the job # and position title you best qualify for with the number of years experience you possess.

Applic. Prog.	______	Project Mgmt.	______
Systems Design	______	Data Base	______
Systems Prog.	______	Telecom/Design	______
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Systems Engineer --- VAX

- Strong VMS and utilities experience required.
- Should be knowledgeable in hardware configuration and system sizing.
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- Exposure to database management packages an asset.
- Major project experience required.

Systems Engineer --- PDP

- Strong RSX and utilities experience required.
- Should be knowledgeable in hardware configuration including special purpose peripherals.
- Experience in system performance tuning desirable.
- MACRO capability.
- Background in real-time projects such as P.L.C. or robot interfaces a plus.

Sr. Systems Analysts

- Must have broad background in factory applications for either assembly or process operations.
- Should have experience with packaged and custom systems.
- Background involving networking of micros, minis, and mainframes is a plus.
- Some non-DEC experience desirable.
- Responsible for writing system development proposals and system functional descriptions. Background in structured analysis techniques desirable.
- Project estimating and scheduling ability required.

Database Architect

- Experience with relational or codasyl packages required.
- Will be responsible for immediate selection and implementation of a D/B package for a major manufacturing system.
- Broad applications background desirable.
- Ability to interface with users to define and document system requirements is essential.

Programmers

- Fortran, C, or equivalent; MACRO desirable.
- Applications span both interactive and real-time programming; maintenance programming rarely needed.
- Background using database management packages beneficial.
- Exposure to graphics workstations a plus.

Selected candidates will have the opportunity to conceive and implement state-of-the-art factory automation projects using any justifiable hardware or software available. All positions require appropriate education and strong project credentials. **DANIEL** offers a nationally competitive salary structure, a comprehensive benefit package, and access to the adjacent fitness center.

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DANIEL INTERNATIONAL

UNIVERSITY OF PITTSBURGH OFFICE OF COMPUTING AND INFORMATION SYSTEMS

Associate Director for Academic Computing

The University of Pittsburgh is seeking an Associata Director for Academic Computing to provide leadership in the application of computing systems to research and instruction. Our Campus of the Future Project is rapidly moving us toward a distributed computing environment using an advanced fiber optic communications network. This presents axciting opportunities to develop Innovativa ways of supporting the computing needs of our students, faculty and researchers.

This new position acknowledges our continued commitment to new and axpanding initiative in academic computing. The Associata Director will serva as the principal advocate for the academic computing community in the office of computing and information systems and will manage a staff of nearly 50 individuals which comprise the academic computing group.

Candidates must have at least 5 years experience in positions that demonstrate progressively greater responsibility and expertise in planning, policy making, and management. The successful candidata must be able to foster effectiva relations with academic users. A thorough knowledge and understanding of computing technology is also essential. A Masters Degree in Computer Science, Information Science, or a related discipline is required; howaver, a Doctorata is preferred. Experience in a university environment is very desirable.

Applicants should send a statement of interast, a current resume, and the names and addresses of 3 references as soon as possibla to Dr. Paul A. Stieman, Director of Computing and Information Systems, 728 Cathedral of Learning, University of Pittsburgh, Pittsburgh, PA 15260. The salary will be competitiva and commensurate with qualifications and will be supplemented by a comprehensiva fringe benefits program.

Applications will be reviewed beginning on January 31, 1985 with the aim of filling the position as soon as possible theraafter. For further details regarding this position, Doctor Stieman can be reached at 412-624-6355. An equal opportunity affirmative action employer.

Director Academic Computing

Applications and nominations ara invited for the position of Director of Academic Computing. This individual is rasponsible for overall campus policy regarding the planning, development, implamentation, and avaluation of academic computing services.

Reporting directly to the Vice Prasident, the Director is responsible for the management and operation of academic computing facilities which include a staff of 25 professionals, a National Advanced Systems (NAS) AS7000N running MVS/SP 1.1 with TSO, two Prime 850 minicomputers, associated terminals and telecommunications equipment and over 300 Microcomputers.

Qualifications: candidates should possess demonstrated management skills in the operation of a large computer center, good communications skills in an academic environment and a thorough knowledge of computer technology and telecommunications systems. Advanced degree or equivalent axperience in Computer Science or related field required.

Applications: Submit nominations or letters of application and rasume by March 1, 1985 to:

Dr. Alan B. Humphrey
Academic Computing
Director Position
THE UNIVERSITY
OF RHODE ISLAND
P.O. Box 357,
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SR. PROGRAMMER/ ANALYST

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The Veterans Administration's Office of Construction is recruiting for a Computer Specialist GS-11/12 located in Washington, DC. Salary: $26,381 to $31,618.

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c. VAX Systems (Systems ranging from VAX 11/725 to 11/785)
d. Micro Computers (DEC PRO350, Rainbow, DECmate, Macintosh, Lisa, IBM PC)

Responsibilities will also include writing technical design documents, software development and contract management. We are looking for a confident and extremely talented individual with complete understanding of Fortran and Macro II and knowledge of the principals and techniques used in interactive computer graphics applications. The ability to analyze user requirements, skill in writing functional and technical specifications, knowledge of software design and the ability to effectively communicate orally and writing must also be demonstrated. If you meet the above requirements, please call Mr. George Williams on (202) 389-2750 for information on application procedures.

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DATA COMMUNICATIONS – SR. ANALYST

We are currently establishing communications to tie each of our 700+ **Jack In The Box** Restaurants together through a polling system. You should have more than three years of Data Communications experience, including Asynchronous and Synchronous Protocols. Knowledge of Assembler, and an upper level language is also required.

MICROPROCESSOR PROGRAMMERS

We have recently installed microprocessor based point-of-sale terminals and real time transaction processing systems into each of our **Jack In The Box** Restaurants. We are now establishing an in-house software development capability and are seeking experienced professionals to design, develop and maintain systems such as order entry, video communications, inventory control and management reporting.

Experience requirements include Microprocessor Assembler Language and five or more years in Applications Development. For immediate consideration please send your resume to: **Robin Jones.**

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P.O. Box 783
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DATA PROCESSING PROFESSIONALS

The Fairbanks North Star Borough data processing division provides data processing services to the Fairbanks community and Fairbanks school district. The borough is initiating a major project to completa the implementation of financial applications software. Wa ara seeking highly skilled professionals for the following positions:

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Plans, organizes, and directs all activities of major application development effort. Minimum 3 years analyst axperience and 2 yaars management.

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Design, implement, program, test, and maintain major applications project. Four years axperience as programmer and/or analyst.

PROGRAMMER

Design and test program logic, codes programs, prepares documentation. Two years axperience as programmer.

All positions requira axperience with an IBM mainframe, preferably an IBM 3400 series, and CICS/COBOL. Experience with MSA financial software is desirable.

Applicants interested in this position should submit their personal resumes to the Human Resources Division, P.O. Box 1267, Fairbanks, AK 99707.

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If your abilities match our high standards and you are ready to meet our challenge, send your confidential resume to:

Jerald W. Bailey
Personnel Manager
P.O. Box 2216
Redding, CA 96099

SYSTEMS PROGRAMMER IV
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Employment Office
NC Memorial Hospital
Chapel Hill, NC 27514
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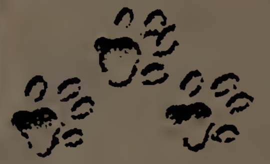

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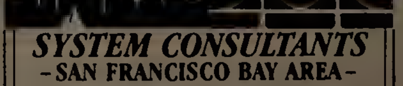

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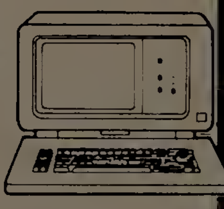

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4341-9	0.52	1 to 4
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4341-1	0.88	2 to 4
4341-11	1.1	2 to 8
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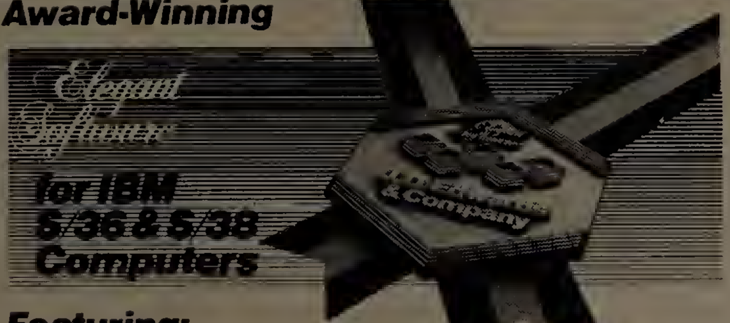

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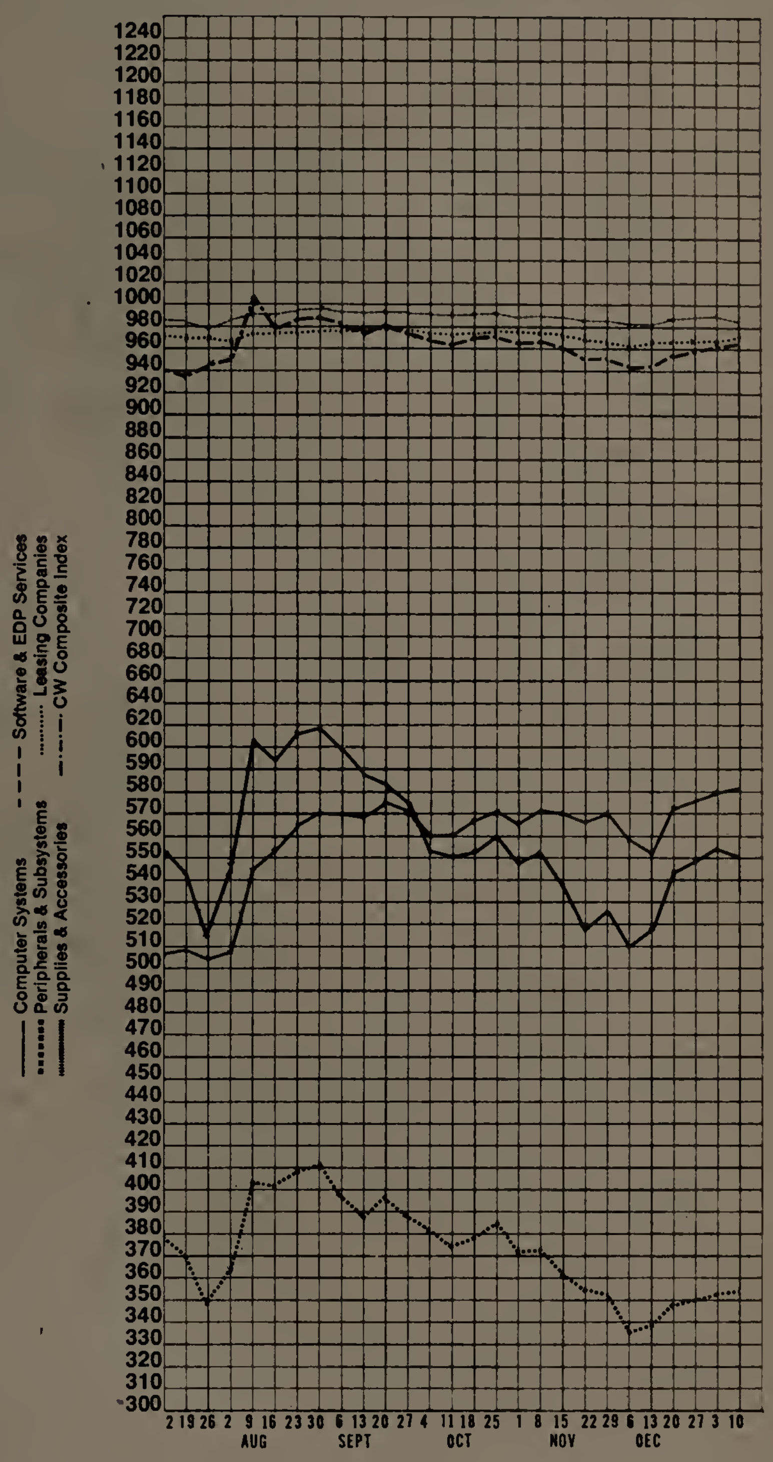

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EXCH		PRICE 1984-85 RANGE (1)	CLOSE JAN 9 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	ALPHA MICROSYSTEMS	6- 24	7 7/8	+ 7/8	+12.5
O	ALTOS COMPUTER SYST	7- 21	9 1/8	- 3/8	-3.8
A	AMDAHL CORP	10- 30	14 1/8	+ 3/4	+5.6
O	APPLE COMPUTER INC	18- 63	28 3/4	- 3/8	-1.2
N	AT&T	15- 21	20 1/8	+ 5/8	+3.2
N	BURROUGHS CORP	44- 59	56 1/8	- 5/8	-1.1
O	COMPAQ COMPUTER CP	4- 15	6 5/8	0	0.0
O	COMPUTER AUTOMATION	3- 17	3 3/8	- 3/4	-18.1
A	COMPUTER CONSOLES	8- 26	11 3/8	- 1/2	-4.2
N	CONTROL DATA CORP	25- 62	34 1/2	- 3/4	-2.1
O	CONVERGENT TECHNOL	5- 41	7 7/8	+1 7/8	+31.2
N	CRAY RESEARCH INC	39- 58	51 1/2	-1	-1.8
O	DAISY SYSTEMS CORP	14- 28	23	-3	-11.5
N	DATA GENERAL CORP	27- 59	55	-3 3/4	-6.3
N	DATAPOINT CORP	14- 31	21	+ 3/4	+3.7
N	DIGITAL EQUIPMENT	84-125	104 3/8	-6 3/8	-5.7
A	EECO INC	12- 16	15 3/4	+ 1/2	+3.2
N	ELECTRONIC ASSOC.	3- 15	3	- 1/4	-7.8
N	FLOATING POINT SYST	13- 44	19 3/4	+ 1/8	+0.6
N	FOXBORO	26- 47	28 1/2	- 1/2	-1.8
O	GENERAL AUTOMATION	5- 18	5 7/8	+ 1/2	+9.3
N	GOULD INC	20- 44	21	- 1/8	-0.5
N	HARRIS CORP	23- 48	27 3/4	+ 5/8	+2.3
N	HEWLETT-PACKARD CO	31- 48	34 5/8	+ 3/4	+2.2
N	HONEYWELL INC	46- 68	55 7/8	-7 3/8	-11.6
N	IBM	103-134	120 3/8	-2 3/4	-2.2
O	IPL SYSTEMS INC	1- 14	1 1/2	+ 1/8	+8.0
N	ITT CORP	21- 47	28 1/2	- 7/8	-2.8
N	M/A-COM INC	13- 35	17 7/8	-1 3/8	-7.1
N	MANAGEMENT ASSIST	9- 29	26 1/4	- 7/8	-3.2
N	MATSUSHITA ELEC(ADR)	56- 88	63	+1 1/2	+2.4
N	MODULAR COMPUTER SYS	6- 16	6 1/4	0	0.0
N	MOHAWK DATA SCI	9- 17	12	+1 1/8	+10.3
N	MOTOROLA INC	29- 49	33 3/4	0	0.0
N	NAT'L SEMICONDUCTOR	11- 20	11 3/4	- 1/8	-1.0
N	NBI INC	15- 38	16 3/4	-1 1/4	-6.8
N	NCR	21- 34	25 5/8	-1	-3.7
N	PERKIN-ELMER	18- 37	25	-1 1/8	-4.3
N	PRIME COMPUTER INC	11- 26	16 1/4	-1 3/4	-9.7
N	SPERRY CORP	35- 50	40 3/4	- 7/8	-2.1
O	STRATUS COMPUTER INC	8- 17	8 3/4	+ 1/4	+2.6
O	TANDEM COMPUTERS INC	15- 40	18 1/4	-1 1/4	-6.4
N	TANDY CORP	24- 62	24 3/8	+ 1/8	+0.5
O	TELEVIDEO SYSTEMS	3- 41	3 1/8	- 1/8	-3.8
O	TELXON CORP	8- 17	16 3/8	+1 3/8	+9.1
N	TEXAS INSTRUMENTS	101-168	117 3/4	-1 3/4	-1.4
A	ULTIMATE CORP	12- 24	12 1/8	-4 1/4	-25.8
O	VECTOR GRAPHICS INC	0- 8	1/4	+ 1/16	+32.8
A	WANG LABS "B"	23- 42	23	-2 5/8	-10.2
A	WANG LABS "C"	23- 42	23 1/4	-2 5/8	-10.1
N	XEROX CORP	35- 52	37 5/8	- 1/4	-0.6
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	10- 22	22 1/4	+ 1/4	+1.1
A	CMI CORP	4- 10	7 7/8	+ 1/8	+1.6
N	COMDISCO INC	8- 42	11 7/8	+ 3/4	+6.7
O	CONTINENTAL INFO SYS	5- 16	6 1/8	- 1/2	-7.5
N	DPF INC	10- 17	15 1/2	0	0.0
O	FINALCO GROUP INC	4- 12	3 7/8	+ 3/8	+10.7
O	PHOENIX AMERICAN INC	3- 17	3 5/8	+ 5/8	+20.8
O	SELECTERM INC	8- 21	8 3/4	+ 1/4	+2.6
N	U.S. LEASING	29- 44	35 1/2	+ 5/8	+1.7
	COMPONENTS				
N	ADVANCED MICRO DEV	25- 41	28 3/8	-1 1/8	-3.8
O	ADV'D SEMICONDUCTOR	15- 38	16	-1	-5.8
N	ANALOG DEVICES INC	20- 32	23	- 5/8	-2.6
O	ANALOGIC CORP	10- 31	11 1/2	+ 1/4	+2.2
N	APPLIED MAGNETICS CP	8- 37	9 3/8	- 1/4	-2.5
O	HADCO CORP	5- 12	5 5/8	0	0.0
O	MICRO MASK INC	10- 19	10 1/8	- 1/8	-1.2
N	TERADYNE	22- 39	25 1/4	- 3/4	-2.9
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	2- 8	2 1/4	0	0.0
N	ADVANCED SYSTEMS INC	9- 22	10 5/8	+ 1/2	+4.9
O	AGS COMPUTERS INC	10- 22	13 3/4	+ 7/8	+6.7
[illegible]	[illegible]	[illegible] 21	15 1/2	0	0.0
N	ANACOMP INC	2- 19	2	- 1/8	-5.8
O	ANALYSTS INTL CORP	5- 17	5 1/4	+ 3/8	+7.6
A	APPLIED DATA RES	18- 37	27	-2 1/8	-7.2
O	ASHTON TATE	6- 15	6 1/2	0	0.0
O	ASK COMPUTER SYSTEMS	13- 21	17 3/4	+ 3/4	+4.4
B	ASTRADYNE COMP IND	1- 7	1 1/4	- 1/8	-9.0
N	AUTOMATIC DATA PROC	30- 44	38 3/8	+ 3/8	+0.9
O	COMPUTER ASSOC INT'L	15- 35	18 1/2	- 7/8	-4.5
O	COMPUTER HORIZONS	8- 20	5 3/4	-1 1/8	-16.3
O	COMPUTER NETWORK	5- 11	8 5/8	- 1/2	-5.4
N	COMPUTER SCIENCES	11- 23	13 7/8	- 1/8	-0.8
O	COMPUTER TASK GROUP	12- 18	15	- 1/8	-0.8
O	COMPUTER USAGE	1- 18	7/8	-2 7/8	-78.8
O	COMPUTONE SYSTEMS	4- 23	5 3/4	+ 1/4	+4.5
O	COMSERV CORP	1- 18	2 5/8	0	0.0
O	COMSHARE	6- 14	6 3/4	0	0.0
N	CULLINET SOFTWARE	24- 50	43 1/4	-1 3/4	-3.8
O	CYCARE SYSTEMS INC	16- 25	20 1/2	+1 1/4	+6.4
O	HOGAN SYSTEM INC	7- 27	6 3/4	-5	-42.5
N	GENERAL ELECTRIC CO	45- 59	57 3/8	+ 3/4	+1.3
N	GTE CORP	36- 48	41	+ 3/8	+0.8
N	INFORMATICS GENERAL	14- 32	15 1/2	-1 3/8	-8.1
O	INFORMATION SCIENCE	4- 17	4 1/4	+ 1/2	+13.3
O	INFOTRON SYSTEMS CP	15- 43	19	0	0.0
O	KEANE ASSOCIATES	8- 15	10 1/4	+ 1/2	+5.1
A	LOGICON	18- 31	25	- 7/8	-3.3
O	LOTUS DEVELOPMENT CP	15- 40	24	0	0.0
O	MCI COMMUNICATIONS	6- 28	7 7/8	+ 3/8	+5.0
O	MNGT SCI AMER INC	8- 33	11 1/4	- 1/4	-2.1
O	MATHEMATICAL APP GRP	6- 18	6 1/2	0	0.0
O	MICOM SYSTEMS INC	27- 50	26 1/2	-2 3/4	-9.4
O	MICROPRO INT'L CP	2- 10	3 3/8	+ 5/8	+22.7
O	NATIONAL DATA CORP	8- 26	8 3/4	-1	-10.2
O	ON-LINE SOFTWARE INT	4- 29	4 1/4	0	0.0
O	PANSOPHIC SYSTEMS	11- 30	14 3/8	+ 1/4	+1.7
N	PLANNING RESEARCH	10- 21	14 1/4	+ 1/2	+3.8
O	POLICY MGMT SYSTS CP	22- 35	25 5/8	-2 1/8	-7.6
O	PROGRAMMING & SYS	4- 8	4	- 1/8	-3.0
O	REYNOLDS & REYNOLD	28- 53	34	+1	+3.0
O	SEI CORP	11- 34	13 3/4	- 1/2	-3.5
O	SHARED MEDICAL SYST	23- 43	27 1/8	+ 1/8	+0.4
O	SCIENTIFIC COMPUTERS	5- 14	5 1/4	+ 1/4	+5.0
O	SOFTWARE AG	8- 16	15	0	0.0
N	URS CORP	10- 18	11 7/8	+ 1/2	+4.3
N	UCCEL	7- 17	13 1/8	+ 3/4	+6.0
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 7	3 3/4	+ 1/2	+15.3
A	ANDERSON JACOBSON	3- 26	3 3/8	- 1/8	-3.5
O	AUTO-TROL TECHNOLOGY	8- 28	8 3/4	+ 1/4	+2.8
O	AVANT-GARDE COMPUTING	11- 29	11 1/4	- 1/2	-4.2
O	BANCTEC INC	5- 22	6 1/4	0	0.0
A	BEEHIVE INT'L	1- 11	5/8	0	0.0
N	BOLT,BERANEK & NEW	17- 30	21	0	0.0
O	CAMBEX CORP	1- 3	1 3/4	+ 1/4	+16.6
N	CENTRONICS DATA COMP	8- 28	9 5/8	-1 1/2	-13.4
A	CETEC CORP	7- 12	7 1/8	- 3/8	-5.0
A	COGNITRONICS	4- 20	5 3/8	+1 3/8	+34.3
N	COMPUGRAPHIC CORP	26- 40	29 5/8	- 1/2	-1.6
O	COMPUTER TRANSCEIVER	1- 10	7/8	0	0.0
N	COMPUTERVISION CORP	29- 53	34	-3 1/4	-8.7
N	CONRAC CORP	11- 24	13 3/4	- 1/2	-3.5
A	DATAPRODUCTS CORP	14- 32	14 1/2	- 3/4	-4.8
A	DATARAM CORP	4- 12	4 7/8	0	0.0
O	DATA SWITCH CORP	5- 41	6 1/8	0	0.0
O	DATUM INC	5- 17	6 5/8	+1 1/8	+20.4
O	DECISION DATA COMPUT	9- 16	12 1/2	+ 1/8	+1.0
O	DOCUTEL-OLIVETTI	4- 39	4 1/4	- 1/4	-5.5
N	ELECTRONIC M & M	5- 11	4 1/2	- 1/4	-5.2
O	ENDATA, INC	6- 16	6	-1	-14.2
O	EVANS & SUTHERLAND	11- 50	13 1/2	+ 1/4	+1.8
O	GANDALF TECHNOLOGIES	9- 14	11 3/4	+ 1/8	+1.0
N	GEN'L DATA COMM IND	10- 20	14 5/8	- 3/4	-4.8
N	HAZELTINE CORP	18- 33	26	-1 3/8	-5.0
O	ICOT CORP	3- 8	3 7/8	- 1/8	-3.1
O	INFORMATION INTL INC	10- 19	12 3/4	+ 1/4	+2.0
O	INTECOM INC	7- 21	8 1/4	+ 1/4	+2.7
O	INTEL CORP	27- 45	28 3/4	+ 3/4	+2.8
A	LUNDY ELECTRONICS	7- 19	9 3/4	- 1/4	-2.5
O	MEGADATA CORP	3- 8	5 7/8	+ 3/8	+6.8
A	MSI DATA CORP	8- 25	9 5/8	- 1/8	-1.2
N	NASHUA CORP	18- 28	26	-2 3/8	-8.3
O	NETWORK SYSTEMS CORP	16- 34	21 1/4	-1 1/4	-5.5
N	NO AMERICAN PHILIPS	30- 40	37 5/8	- 7/8	-2.2
N	NORTHERN TELECOM LTD	30- 48	31 3/4	-2 3/8	-6.8
O	OMEX	1- 6	1/8	0	0.0
N	PARADYNE CORP	11- 28	13 3/4	- 1/4	-1.7
A	PENRIL CORP	8- 14	11 3/4	- 1/4	-2.0
N	PLESSEY CO (ADR)	24- 41	23 1/2	- 1/4	-1.0
O	PRINTRONIX INC	13- 34	16 1/4	+2 1/4	+18.0
O	RAMTEK CORP	4- 23	5 1/4	+ 3/8	+7.6
N	RECOGNITION EQUIP	10- 17	10 7/8	-1 1/2	-12.1
N	SANDERS ASSOCIATES	32-120	31 5/8	-4 1/4	-11.8
O	SCAN-TRON CORP	9- 19	12 1/2	+ 1/4	+2.0
N	SCIENTIFIC ATLANTA	8- 23	10 3/4	+ 1/8	+1.1
O	SEAGATE TECHNOLOGY	4- 20	5 3/4	+ 3/4	+15.0
N	STORAGE TECHNOLOGY	2- 23	2 1/8	- 1/8	-5.5
O	SYKES DATATRONICS	1- 13	1 1/2	+ 1/8	+8.0
O	SYSTEMS & COMP TECH	11- 39	10 3/4	-5	-31.7
A	T BAR INC	7- 17	7 3/8	+ 5/8	+8.2
A	TAB PRODUCTS CO	13- 20	14 1/4	- 3/4	-5.0
O	TANDON CORP	6- 35	7 7/8	+1 7/8	+31.2
A	TEC INC	6- 12	9	+ 3/4	+8.0
N	TEKTRONIX INC	52- 87	54 7/8	-2 7/8	-4.8
N	TELEX	19- 36	34 3/4	-1 1/8	-3.1
O	TESDATA SYSTEMS CP	2- 17	2 1/4	+ 1/8	+5.8
N	TIMEPLEX INC	13- 23	18 3/4	+ 1/4	+1.3
O	VISUAL TECHNOLOGY	3- 26	2 5/8	0	0.0
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	17- 23	20 3/4	0	0.0
N	BARRY WRIGHT	21- 33	21 3/8	- 7/8	-3.9
A	DUPLEX PRODUCTS INC	22- 27	27	- 1/4	-0.8
N	ENNIS BUS. FORMS	18- 31	31	+2	+6.8
N	3M COMPANY	69- 80	78 5/8	0	0.0
N	MOORE CORP LTD	35- 51	45 3/8	+ 1/8	+0.2
O	STANDARD REGISTER	27- 45	46 1/4	+2	+4.5
N	WALLACE COMP SERVICE	23- 33	30 3/4	- 5/8	-1.8

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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